# PW-DN427 User Guide

## Wireless Lite-N USB Adapter



## FCC STATEMENT

## FC

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.

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.
- 2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The manufacturer is not responsible for any radio or tv interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

#### FCC RF Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment has been SAR-evaluated for use in hand. SAR measurements are based on a 5mm spacing from the body and that compliance is achieved at that distance.

Note: The channel of adapter is decided by AP. Therefore, the channel of the product will be restricted between CH1 and CH11 when worked in USA.

## **CE Mark Warning**

# CEO

This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

## **National restrictions**

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reason/remark
Bulgaria		General authorization required for outdoor use and public service
France	Outdoor use limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz	Military Radiolocation use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012
Italy		If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply(not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation		Only for indoor applications

Note: Please don't use the product outdoors in France.

Package C	ontents	1
Chapter 1	Introduction	2
1.1	Product Overview	2
1.2	Main Features	2
1.3	LED Status	2
Chapter 2	Installation Guide	3
2.1	Hardware Installation	3
2.2	Software Installation	3
	2.2.1 Overview	3
	2.2.2 Installation Guide	3
2.3	Uninstall Software	8
	2.3.1 Uninstall the driver software from your PC	8
	2.3.2 Uninstall the utility software from your PC	8
Chapter 3	Configuration	9
3.1	Configuration of Utility	9
	3.1.1 Profile	9
	3.1.2 Network	12
	3.1.3 Advanced	13
	3.1.4 Statistics	14
	3.1.5 WPS	14
	3.1.6 Radio On/Off	16
	3.1.7 About	
	3.1.8 An example for application	17
3.2	Configure with Windows XP Wireless Zero Configuration	17
Chapter 4	AP Mode	20
4.1	Config	20
4.2	Access Control	21
4.3	Mac Table	22
4.4	Event Log	23
4.5	Statistics	24
4.6	About	25
Chapter 5	Example for Application	
5.1	Configuration of PSP XLink Online game	27
Appendix A	A: Glossary	32
Appendix	B: Specifications	35

## CONTENTS

## **Package Contents**

The following items should be found in your package:

- > One PW-DN427 Wireless Lite-N USB Adapter
- > One USB extension cable
- > One Resource CD for PW-DN427 Wireless Lite-N USB Adapter, including:
  - Drivers and Utility
  - User Guide
  - Other Helpful Information

#### P Note:

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact with your distributor.

## Chapter 1 Introduction

#### **1.1 Product Overview**

Thank you for choosing the PW-DN427 Wireless Lite-N USB Adapter.

The adapter is designed to provide a high-speed and unrivaled wireless performance for your computer. With a faster wireless connection, you can get a better Internet experience, such as downloading, gaming, video streaming and so on.

The PW-DN427 Wireless Lite-N USB Adapter complies with IEEE 802.11g and IEEE 802.11b standards. It can perfectly interoperate with all the 802.11n/g/b devices. The PW-DN427's auto-sensing capability allows high packet transfer rate of up to 150Mbps for maximum throughput.

Additionally, the PW-DN427 adapter has good capability on anti-jamming and supports WEP, TKIP, AES, WPA and WPA2 encryption to prevent outside intrusion and protect your personal information from being exposed.

The adapter is easy to install and manage. The PW-DN427 supports WPS function, which can help you create a wireless connection immediately. Quick Setup Wizard is supported and detailed instructions are provided step by step in this user guide.

Featuring high performance transmission rates, simple installation and adaptability, as well as strong security, the PW-DN427 Wireless Lite-N USB Adapter is the perfect solution for small office and home needs.

#### 1.2 Main Features

- > IEEE 802.11n, IEEE 802.11g, IEEE 802.11b standards
- Supports USB 2.0 bus standard
- Supports WPA data security, IEEE 802.1x authentication, TKIP/AES encryption, 64/128-bit WEP encryption
- Supports wireless LAN data transfer rate of up to 150Mbps
- Supports Ad-Hoc and Infrastructure modes
- > Supports roaming between access points when configured in Infrastructure mode
- > Eases configuration and provides monitoring information
- Supports Windows 2000/ XP/ Vista/ 7

#### 1.3 LED Status

The LED on the top of this card indicates Link/Act status. It blinks when sending and receiving data.

## **Chapter 2** Installation Guide

#### 2.1 Hardware Installation

- 1. Connect one end of the USB cable to the Adapter.
- 2. Connect the other end of the USB cable to the USB port on your computer. Because the Adapter gets its power from the host, there is no external power supply. The LED should light up when the Adapter is plugged in and the PC is on.

#### P Note:

The Adapter can also be plugged into the USB port on your computer directly.

#### 2.2 Software Installation

#### 2.2.1 Overview

For Windows 7, the driver will be searched and installed automatically after you finish hardware installation.

For Windows 2000/ XP/ Vista, the Adapter's Setup Wizard will guide you through the installation of the Utility and drivers. Before you install the software, please connect the USB adapter with your computer by USB cable. After that, you will be prompted "Found New Hardware Wizard", click the **Cancel** button, and run the Setup Wizard program on the CD-ROM.

The Setup steps for Windows 2000/ XP/ Vista are very similar, so the following installation guide takes Windows XP for example.

#### 2.2.2 Installation Guide

 Insert the Resource CD into your CD-ROM drive, and open the folder named PW-DN427. Double-click **Setup.exe** in the proper folder according to your operating system to start the installation, then the following screen for preparing setup will appear.

RL51 Wireless Lite-N	Client Utility installation Program	
Preparing Setup Please wait while the InstallShi	ield Wizard prepares the setup.	
	RL51 Wireless Lite-N Client Utility Setup is preparing the InstallShield Wizard, which wi you through the rest of the setup process. Please wait.	ll guide
InstallShield		Cancel

Figure 2-1 Preparing Setup

2. Then you'll see the screen as follow, you can choose what to be installed.

	Client Utility installation Program	X
Setup Type Select the setup type that best	; suits your needs.	
Select the setup type that best	<ul> <li>csuits your needs.</li> <li>Choose to install</li> <li>Install driver and RL51 Wireless Lite-N Client Utility</li> <li>Install driver only</li> </ul>	
InstallShield	< <u>B</u> ack <u>N</u> ext >	Cancel

Figure 2-2 Setup Type

3. As next screen, you can select the configuration tool here.

PW-DN427 Wireless Lite-N USB Adapter User Guide

RL51 Wireless Lite-N	Client Utility installation Program	$\mathbf{X}$
Setup Type Select the setup type that best	suits your needs.	
	Select Configuration Tool.	
	<ul> <li><u>RL51 Configuration Tool</u></li> <li>Microsoft Zero Configuration Tool</li> </ul>	
InstallShield	< <u>B</u> ack <u>N</u> ext >	Cancel

Figure 2-3 Setup Type

- I. If you want to install the RL51 Wireless Lite-N Client Utility, please select the **RL51 Configuration Tool** and click **Next**.
- II. If you only want to use the **Microsoft Zero Configuration Tool** to configure the wireless connection, please select **Microsoft Zero Configuration Tool** and click **Next**.
- 4. Then, choose the destination location.



Figure 2-4 Choose Destination Location

5. After that, you will see the next screen as below. Click **Install** to continue.

RL51 Wireless Lite-N Cl	lient Utility installation Program	
Ready to Install the Program The wizard is ready to begin installa	ation.	
	Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit wizard.	the
InstallShield	< <u>B</u> ack [Install] Cance	el ]

Figure 2-5 Ready to Install the Program

6. The following screen for installing will appear.



Figure 2-6 Setup Status

#### Note:

While files are copying, a warning box about Windows Logo testing (shown in Figure 2-7) may

pop up, please click Continue Anyway to continue the installation for our drivers have been tested thoroughly and are able to work with the operating system.

Har dwar	e Installation
<u>.</u>	The software you are installing for this hardware: 150Mbps Wireless Lite N Adapter has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.) Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
	Continue Anyway

Figure 2-7 Windows XP Warning Box

7. After the files have been successfully copied, the screen in Figure 2-8 will appear. Click the Finish button to finish the wizard.

RL51 Wireless Lite-N (	lient Utility installation Program
	InstallShield Wizard Complete
	The InstallShield Wizard has successfully installed RL51 Wireless Lite-N Client Utility . Click Finish to exit the wizard.
InstallShield	< Back Finish Cancel

Figure 2-8 InstallShield Wizard Complete

After installing the driver successfully, you should see an icon *III* or *III* appear in your system tray.

#### 2.3 Uninstall Software

#### 2.3.1 Uninstall the driver software from your PC

- 1. On the Windows taskbar, click the **Start** button, and then click **Control Panel**.
- 2. Double-click the **System** icon, click on the **Hardware** tab in the **System** window.
- 3. Click on the **Device Manager** button, double-click **Network Adapters,** and then right-click **150M Wireless Lite-N Client Adapter**.



Figure 2-9 Device Manager

4. Click **Uninstall** shown in above Figure 2-9, the system will uninstall the driver software of the adapter from your PC.

#### 2.3.2 Uninstall the utility software from your PC

- 1. On the Windows taskbar, click the **Start** button, point to **All programs**→ **RWCU**, and then click **Uninstall-RL51 Wireless Lite-N Client Utility**.
- 2. Following the Install Shield Wizard to uninstall the utility software from your PC.

## **Chapter 3** Configuration

#### 3.1 Configuration of Utility

PW-DN427 Wireless USB Adapter can be configured by its utility for Windows 2000/ XP/ Vista. This section will take the configuration in Windows XP for example and guide you to configure your wireless adapter for wireless connectivity with trustable data security encryption features. The configuration steps in Windows 2000/ XP/ Vista are similar. For the configurations in Windows 2000/ Vista, please refer to the instructions in Windows XP.

After the Adapter's driver and utility has been installed, the adapter's tray icon, *III* or *III*, will appear in your system tray. It means the utility is running on your system. If the utility does not run, you can run the utility by clicking: **Start**> **All programs**> **RWCU**> **RL51 Wireless Lite-N Client Utility**. If the icon still does not appear, the driver or utility may be installed incorrectly or the adapter is unplugged, please try again.

Icon III means the connection has been established. Icon III means there is no connection.

Double-click the **ull** icon and the configuration screen of the utility will appear. You can also run the utility by clicking: **Start> All programs> RWCU> RL51 Wireless Lite-N Client Utility**. The utility provides a complete and easy manage tools to:

- > Display current status information
- > Edit and add configured profiles
- > Display current diagnostics information

#### P Note:

If your OS is Windows XP, you can use Windows XP to configure the wireless network settings. (To use this function, you must upgrade the OS with sp2).

If you want to use Windows XP to configure wireless network settings, just right-click the icon

at the bottom of the screen, and click **Use Zero Configuration as Configuration utility** to switch the utility.

#### 3.1.1 Profile

Click the **Profile** tab of the utility and the **Profile** screen will appear as Figure 3-1. The **Profile** screen provides tools to:

- Add a Profile
- > Edit a profile
- > Delete a profile
- > Activate a profile

PW-DN427 Wireless Lite-N USB Adapter User Guide

RL51 Wi	eless Lite-N Clie	ent Utility					×
	<u></u>	Ť		Ø	Ŷ		
Profile	e Network	Advanced	Statistics	WPS	Radio On/Off	About	
		— Profile List —					
					Profile Name	e >>	
					SSIE	) >>	
					Network Type	3 >>	
					Authentication	<< ר	
					Encryption	י >>	
					Use 802.1:	< >>	
					Tx Powe		
					Channe		
					Power Save Mode		
<b>Restaura</b>		Carlos Decardo			RTS Threshold		
Ac	d Edi	t D	elete	Activate	Fragment Threshold	3>>	
							-

Figure 3-1 Profile Tab

 To Add a new profile: Click the Add button on the Profile tab, the Profile configuration screen will appear as shown in Figure 3-2. Enter the Profile Name and choose the SSID from the pull-down list, then click OK to add it.

RL51 Wirele	ss Lite-N Clie	nt Utility						×
Profile	Letwork	Advanced	Statistics	Ø WPS	Radio On/Off	About		
		— Profile List —						
					Profile Na	me >>		
					S	5ID >>		
					Network Ty	pe >>		
					Authenticat			
					Encrypt			
					Use 802 Tx Poi			
						nel >>		
					Power Save Mo			
Add	Edit	n	elete	Activate	RTS Thresh Fragment Thresh			
had	E919		-10 -00	nocivare	r ragment mresn			
System C	Config Auth	n. \Encry.	802,1x					
Pro	ofile Name >> PRO	F1		Network	< Type >> Infr	astructure	•	
	SSID >>		•	• T× I	<sup>o</sup> ower >>	Auto	•	
				Pre	amble >>	Auto	-	
Po	ower Save Mode >>	🕗 CAM	🖉 PSM					
	RTS Threshold		0		2347 234	7		
0	Fragment Thre	shold 2	.56		2346 2346	5		
			ок	c	Cancel			

Figure 3-2 Add a new profile

- Profile Name Identifies the configuration profile. This name must be unique. Profile names are not case-sensitive.
- SSID The IEEE 802.11 wireless network name. This field has a maximum limit of 32 characters.
- RTS Threshold Here you can specify the RTS (Request to Send) Threshold. The default value is 2347.

- Fragmentation Threshold This value is the maximum size determining whether packets will be fragmented. Setting the Fragmentation Threshold too low may result in poor network performance since excessive packages. 2346 is the default setting and is recommended.
- 2. **To edit a profile:** Highlight the desired profile name on **Profile List**, and click the **Edit** button, the **Profile** configuration screen will appear shown in Figure 3-3.

RL51 Wireles	ss Lite-N Clie	nt Utility					
Profile	LLL Network	Advanced	Statistics	Ø WPS	Radio On/Off	About	
		— Profile List —					
PROF1				b	Profile Name SSIE		
						e >> Infrastruct	ure
					Authenticatior Encryptior		
					Use 802.1		
						r >> Auto	
					Channe Power Save Mode	el >> Auto	
					RTS Threshold		
Add	Edit	De	elete	Activate	Fragment Threshold	d>>n/a	
System Co	onfig Auth	n. \ Encry.					
Pro	file Name >> PRO	F1		Networl	< Type >> Infras	tructure	-
	SSID >>			• Tx I	Power>> A	iuto 🗨	-
	,			Pre	amble >> A	uto	·
Pot	wer Save Mode >>	🙆 CAM	PSM				
_	<b>.</b>						
L	RTS Threshold		0	<u>`</u>	2347 2347		
	] Fragment Thre	shold 2	56	<u>`</u> `	2346 2346		
			ОК	0	Cancel		

Figure 3-3 Edit a Profile-System Configuration

- > System Config: Here you can change the Profile Name and SSID.
- > Auth.\Encry.: Click the Auth.\Encry., you can skip to the following screen.

PW-DN427 Wireless Lite-N USB Adapter User Guide

.51 Wireless L							
P=		<b>1</b>		0	<b>Q</b>		
Common 0	Network	Advanced	Statistics	WPS	Radio On/Off	About	
		– Profile List –					
PROF1				Ø	Profile Name	e >> PROF1	
						) >>	
						e >> Infrastructu	re
					Authenticatio Encryptio		
					Use 802.1		
						r >> Auto	
						el >> Auto	
					Power Save Mod RTS Threshol		
Add	Edit	De	elete	Activate	Power Save Mod RTS Threshol Fragment Threshol	d >> n/a	
Add	Edit	De	elete	Activate	RTS Threshol	d >> n/a	_
Add System Config		De	802,1x	Activate	RTS Threshol	d >> n/a	
System Config		\Encry.		Activate	RTS Threshol Fragment Threshol	d >> n/a d >> n/a	Use 802.1X
System Config Au	g Auth.	\Encry.	802, 1x		RTS Threshol Fragment Threshol	d >> n/a d >> n/a	Use 802.1X
System Config AL WPA P	g Auth. uthentication >	\Encry.	802, 1x		RTS Threshol Fragment Threshol	d >> n/a d >> n/a	Use 802.1X
System Config AL WPA P	g Auth. uthentication > Preshared Key >	\Encry.	802, 1x		RTS Threshol Fragment Threshol	d >> n/a d >> n/a	Use 802.1X
System Config AL WPA P	g Auth. uthentication > Preshared Key >	\Encry. > Open	802, 1x		RTS Threshol Fragment Threshol	d >> n/a d >> n/a	ow Password you choose the
System Config AL WPA P	g Auth. uthentication > rreshared Key > Wep Key ( Key#1	NEncry. > Open > Hex	802, 1x		RTS Threshol Fragment Threshol	d >> n/a d >> n/a	w Password you choose the lecimal mode,the ble input
System Config AL WPA P	g Auth. uthentication > vreshared Key > wep Key & Key#1 @ Key#2	Encry. Open Hex Hex	802, 1x		RTS Threshol Fragment Threshol	d >> n/a d >> n/a	ow Password you choose the lecimal mode,the

Figure 3-4 Edit a Profile-Auth.\Encry.

- Authentication You can choose the Authentication Type from the pull-down list with three options, Open System, Shared-Key System or LEAP.
- > **802.1x** It enables when Authentication Type is setting to WPA.
- Encryption Displays which encryption type that the driver is using. When you select Open System, Shared-Key System as Network Authentication, there are two options: WEP and Disabled. If you select WPA-PSK as Network Authentication, there are TKIP and AES options instead of WEP and Disabled.
- Wep Key Key #1, Key #2, Key #3, Key #4, the Key groups. You can enter 10 hexadecimal digits (any combination of 0-9, a-f, A-F) or 5 ASCII characters for 64-bit (also called 40bits) encryption. You can enter 26 hexadecimal digits (any combination of 0-9, a-f, A-F) or 13 ASCII characters for 128-bit (also called 104bits) encryption.
- 3. **To delete a profile:** Highlight the desired profile name on **Profile List**, and click the **Delete** button.
- 4. To switch to another profile: Highlight the desired profile name on Profile List, and click the Activate button.

#### 3.1.2 Network

Click the **Network** tab of the Utility and the **Network** screen with many available wireless network

choices will appear as Figure 3-5.

51 Wireles	s Lite-N Clie	Advanced	Statistics	Ø WPS	Radio On/Off	About	
Sorted by >:	» 🥥	ssid 🥝	Channel	🥥 Signal		Show dBm	
001601E626E	54	<b>1</b> 0	<u>B9 n</u> ø	AP List >> — 0%			_
ap81_test		1	<b>Bg n</b> <del>7</del>	2%	•		
for_743_test	t_0128	11	B <mark>9</mark> 🖬 🕀	7%	-		
mafei		11	<b>b</b> g 💡	2%	•		_
Network-002	2586b732fe	11	🕒 📴 🗖 🕄	0%			
Network-174	131463	<b>1</b> /2	🕒 📴 🗍 🚯	0%			
OvisLink_198	3789	<b>1</b> 2	🕒 📴 🗍 🔂	23%			~
Rescan	Add	to Profile	Connect				



- > **Rescan:** Click the **Rescan** button to refresh the list at any time.
- Add to Profile: Highlight an SSID and click the Add to Profile button to add the network to the profile. The continued steps are similar to add a new profile, please refer to the 3.1.1 Profile: To Add a new profile.
- Connect: Highlight an SSID and double-click or click the Connect button to connect to an available network without adding it to the profile.

#### 3.1.3 Advanced

Click the **Advanced** tab of the Utility and then you can choose the wireless mode on the following screen.

RL51 Wireles	s Lite-N Clier	nt Utility					
Profile	LLL Network	ر Advanced	Statistics	Ø WPS	Radio On/Off	About	
	📔 Enable	) TX Burst			Fast Roaming at	-70 <b>dBm</b>	
	🔼 Enable	• TCP Window Size			Show Authentication	ı Status Dialog	2
			Appl	у			

#### Figure 3-6 Advanced

- > Enable TX Burst It can translate more data when it enable.
- Fast Roaming at Roaming will disable when Transmit Power is below some dBm if the function is selected.
- Show Authentication Status Dialog- Click the checkbox to show the Authentication Status Dialog.

> **Apply -** Click the Apply button to save the current setting.

#### 3.1.4 Statistics

Click the **Statistics** tab of the Utility and you will see the following screen displaying the receiving and transmitting statistical information. Click the **Reset Counter** button to reset the count of the statistics information.

.51 Wireles	s Lite-N Clier	nt Utility	Ā	0	<b>P</b>		
Profile	Network	Advanced	Statistics	WPS	Radio On/Off	About	
Transm	n <mark>it R</mark> e	ceive					
F	rames Transmitte	d Successfully		=		897	
F	rames Retransmit	ted Successfully		=		897	
F	rames Fail To Rece	eive ACK After All R	etries	=		0	
F	TS Frames Succes	sfully Receive CTS		=		0	
F	TS Frames Fail To	Receive CTS		-		0	
Reset Col	unter						

Figure 3-7 Statistics tab

#### 3.1.5 WPS

Click the **WPS** tab of the Utility and you can configure the WPS function to joint an existing network quickly in the following screen.

RL51 Wireless Lite-N Client Utility					
Profile Network Advance	d Statistics	Ø WPS	Radio On/Off	About	
Config Mode WPS					
	ID.	Network-	17431463	00-14-78-94-14-63	
	<				>
Press the "WPS" button of the AP, and then		Rescan		Information	
press the "WPS" button above.					
Auto					$\rightarrow$
Progress >> 0%	<	Connect	Disconnect	Export Profile	Delete
	55531	55111555	2.000111001	20,20131100110	
					-

Figure 3-8 WPS tab

- The WPS connection will be automatically displayed on the WPS Profile List. Pitch on the Profile and click Export Profile to add a Profile to the Profile List (Section 3.1.1).
- The Auto function is default to enable that the adapter will automatically try to build the connection with the Access Point devices shown in the WPS AP List one by one.
- You can also establish a wireless connection by using either Push WPS Button method or PIN method. It is recommended that you choose the simplest method that your AP device

supports.

#### Note:

To build a successful connection by WPS, you should also do the corresponding configuration of the Access Point for WPS or WPS function meanwhile.

#### I. PBC Method

If your Access Point is equipped with a push-button for Wi-Fi Protected Setup, you can connect the adapter to the Access Point by Push WPS Button method.

Step 1 Press the WPS button on your Access Point device.

Step 2 Click the **WPS** button (marked by the red circle) on the screen as Figure 3-9.

RL51 Wireless Lite-N C	lient Utility						
Profile Network	ل Advanced	Statistics	Ø WPS	Radio On/Off	About		
Config Mode		Statistics	WF3	WPS AP List	About		
		D:	Network-1	17431463	00-14-78-94-14-63	2	<b>4</b>
Press the "WPS" button of ti	be AP, and then		Rescan		Information		
press the "WPS" button abo							
Auto Progress >> 0%							>
		Detail	Connect	Disconnect	Export Profile	Delete	

Figure 3-9 WPS- WPS BUTTON mode

**Or:** Press and hold the WPS button on the adapter for 2 or 3 seconds.

#### II. PIN Method

If your Access Point supports Wi-Fi Protected Setup and the PIN method, you can add the adapter to the network by the following two ways:

1) Enter a PIN from my Access Point

Choose the **Config Mode** as **Registrar** and enter the PIN of AP into the field under the **Pin Code** as Figure 3-10 shown. And then click **PIN** button to start the wireless connection without doing any configuration for AP.

Profile Image: Second Statistics     Profile     Network     Advanced     Statistics     WPS   Radio On/Off     Network     Advanced   Statistics     WPS   Radio On/Off     VPS AP List     ID:   1D:    1D:   1D:    1D:   1D:   1D:    1D:    1D:   1D:    1D:    1D:    1D:    1D:   1D:    1D:    1D:    1D:   1D:   1D:    1D:    1D:	RL51 Wireless Lite-N Cli	ient Utility						×
Config Mode       VVPS AP List         Registrar       ID:         Pin Code       ID:         61028906       Rescan         Input the pin code of the AP, and then press       Rescan         Imput the pin code of the AP, and then press       VVPS AP List         Imput the pin code of the AP, and then press       Rescan         Imput the pin code of the AP, and then press       Information         Imput the pin code of the AP, and then press       Information         Imput the pin code of the AP, and then press       Information         Imput the pin code of the AP, and then press       Information         Imput the pin code of the AP, and then press       Information         Imput the pin code of the AP, and then press       Imput the pin code of the AP, and then press         Imput the pin code of the AP, and then press       Imput the pin code of the AP, and then press         Imput the pin code of the AP, and then press       Imput the pin code of the AP, and then press         Imput the pin code of the AP, and then press       Imput the pin code of the AP, and then press         Imput the pin code of the AP, and then press       Imput the pin code of the AP, and then press         Imput the pin code of the AP, and then press       Imput the pin code of the AP, and then press         Imput the pin code of the AP, and then press       Imput the pin cod	Constraints O	<u></u>		Ø	A			
Pin Code     EIN       ID:     15AA7A       00-27-19-15-AA-7A     5       ID:     3AOWENPING       00-1D-0F-01-06-30     6       ID:     3AOWENPING       00-1D-0F-01-06-30     6       Rescan     Information       Information     Information       ID:     ExRegNW307005	Profile Network	Advanced	Statistics	WPS	Radio On/Off	About		
ID:     15AA7A     00-27-19-15-AA-7A     5       Pin Code     ID:     3AOWENPING     00-1D-0F-01-06-30     6       ID:     3AOWENPING     00-1D-0F-01-06-30     6       Rescan     Information       Input the pin code of the AP, and then press     Rescan     Information       Rescan     Information     Information		PIN						
61028906     Renew       Input the pin code of the AP, and then press     Rescan       Input the pin code of the AP, and then press     WPS AP List       Image: Auto     ExRegNW307005       Progress >> 0%     Image: Auto	Registrar 🔽		D:	15AA7A		00-27-19-15-AA-7A	5	<u>^</u>
Input the pin code of the AP, and then press     Rescan     Information       Input the pin code of the AP, and then press     WPS AP List     ExRegNW307005       Auto     ExRegNW307005     U	Pin Code	1	D :	BAOWENP		00-1D-0F-01-06-30	6	
Input the pin code of the AP, and then press the "PIN" button above. Auto Progress >> 0%	61028906 Renew	<						
ExRegNW307005	Input the pin code of the AP, a	and then press		Rescan		Information	100	
Progress >> 0%	the "PIN" button above.							
Progress >> 0%	🙆 Auto		ExRegNW307005				Ū	
Detail Connect Disconnect Export Profile Deter	Progress >> 0%	_ <						
		_	Detail	Connect	Disconnect	Export Profile	Delete	

Figure 3-10 WPS - Registrar mode

#### Note:

The default PIN code of the AP always can be found in its label or User Guide.

#### 2) Enter the PIN into my Access Point

Choose the **Config Mode** as **Enrollee** and click the **PIN** button on the screen as Figure 3-11. Meanwhile, enter the PIN code of the adapter into the configuration utility of the AP. For the detailed instructions of the AP configuration, please refer to the User Guide of the AP.

RL51 Wireless Lite-N Client Utility						
Profile Network Advance	ed Statistics	() WPS	Radio On/Off	About		
Config Mode			WPS AP List			
Enrollee	ID :	15AA7A		00-27-19-15-AA-7A	5	^
Pin Code	ID :	BAOWENPI		00-1D-0F-01-06-30	6	~
61028906 Renew	<u>&lt;</u>	Rescan		Information		
button in the AP, and then press the "PIN"						
button above.						
Progress >> 0%	< Detail	Connect	Disconnect	Export Profile	Delete	

Figure 3-11 WPS - enrollee mode

#### P Note:

The PIN code of the adapter is displayed on the WPS configuration screen as Figure 3-11 (the default PIN code for this adapter is 08781949 as Figure 3-11 shown).

#### 3.1.6 Radio On/Off

You can turn on/off the wireless radio by clicking the icon <sup>2</sup> of the Utility. The green icon will turn

to red 🔺 when the wireless radio is turned off.

#### 3.1.7 About

Click the **About** tab of the Utility and you will see the following screen with some information about this adapter.

RL51 Wirele	ss Lite-N Clie	ent Utility					
Profile	Land Network	ر Advanced	Statistics	Ø WPS	Radio On/Off	About	
		Utility Version >>			Date >>	01-15-2010	
		Driver Version >>		Firr	Date >> nware Version >>	06-17-2009 0.12	
		Phy_Address >>	00-0C-43-	30-70-05			
							T

Figure 3-12 About

- > **Utility Version -** The version of this utility.
- > **Utility Date -** The creation date of this utility.
- > Driver Version The version of the wireless network adapter driver.
- > Driver Date The creation date of the wireless network adapter driver.
- Firmware Version -The version of the adapter firmware.
- **EEPROM Version -** The version of this EEPROM.
- > **Phy\_Address -** The MAC address of the wireless network adapter.

#### 3.1.8 An example for application

Suppose you have an installed and using AP, the SSID is TEST and it adopts 64-bit encryption with the key 0123456789. To establish a connection with this AP, please follow these steps below:

- 1. Launch RL51 Wireless Lite-N Client Utility.
- 2. Click the **Profile** tab of the utility and click the **Add** button on the screen that appears.
- The Profile configuration screen will appear, please enter *Test* for the Profile Name, *TEST* for the SSID, select *Infrastructure* for the Network Mode, select *WEP* for the Data Encryption and enter 0123456789 for Network key.
- 4. Click **OK** to save this profile.
- 5. Highlight the profile named *Test* on the profile list and click **Activate** on the Profile screen. The utility will establish a connection with this AP by configured profile.

#### 3.2 Configure with Windows XP Wireless Zero Configuration

1. Right click the icon  $\mathbf{1}$  on the bottom of the desktop first and you will see Figure 3-13.

Double click the **Use Zero Configuration as Configuration utility** option to enable Wireless Zero Configuration function.

Launch Config Utility	
Use Zero Configuration as Configuration Utility	202
Switch to AP Mode	F-art
Exit	118

Figure 3-13 Use Zero Configuration as Configuration utility

2. After that, double click the icon  $\square$ , and the following Figure 3-14 will appear with some available wireless network choices. You can highlight a network and then click **Connect** to add to a network.

( <sup>(0))</sup> Wireless Network Connecti	on	×
Network Tasks	Choose a wireless network	
💋 Refresh network list	Click an item in the list below to connect to a wireless network in range or to get more information.	
Set up a wireless network for a home or small office	((Q)) TEST Unsecured wireless network	~
Related Tasks		
<ul> <li>Learn about wireless networking</li> <li>Change the order of preferred networks</li> </ul>		
Change advanced settings		
		~
	Connec	

Figure 3-14 Choose a wireless network

#### P Note:

If you have not installed SP2 for Windows XP, the screen above will not be available.

3. During the connection, you will see the screen as Figure 3-15 shown.

PW-DN427 Wireless Lite-N USB Adapter User Guide



Figure 3-15 Acquiring network address

4. If the connection is finished, the icon will display like the next screen shown.



Figure 3-16 Finish

## Chapter 4 AP Mode

Click the *iii* icon to switch to AP Mode. In this mode you can use the PW-DN427 as a soft AP.





#### PNote:

At this time, if your PC have Installed other network card (wireless or wire), you will be prompted "ICS Select WAN Adapter" to select one of them to be "WAN". With this function PW-DN427 can serve as wireless router based on the selected card connecting to the Internet, which will make the APs of the LAN share the Internet.

ICS Select VAN Adam	tpter 🔀
WAN Adapter Name:	Realtek RTL8139/810× Family Fast Ett 💌
LAN Adapter Name:	150Mbps Wireless Lite N Adapter
	ΟΚ

Figure 4-2

#### 4.1 Config

Here you can do some basic configurations.

_	-	-	_		
P۱	Λ	1_	D	N	Λ
			ັ		_

🔓 RL51 Wire	less Lite	-N Client	Utility			X
Config Access	Control   Ma	ac Table   Ev	ent Log   9	Statistics Abou	at	
SSID Channel	SoftAP-00		[	<- Use Mac		
<ul> <li>□ No forward</li> <li>□ Hide SSID</li> <li>□ Allow BW 4</li> </ul>		vireless clients				
Beacon (ms)			100			
TX Power		100 %	•			
Idle time(60 - 3	600)(s)		300			
				Default	Cancel	Apply

Figure 4-3 Config Setting Page

- SSID Enter the SSID of your soft AP, or you can press "<- Use Mac Address" button to keep the Mac Address as your SSID.
- Channel Select the channel from the drop-down list. This field determines which operating frequency will be used.
- Beacon Enter a value between 20-1000 milliseconds for Beacon Interval here. The beacons are the packets sent by the router to synchronize a wireless network. Beacon Interval value determines the time interval of the beacons. The default value is 100.
- **TX Power** Manually force the AP's transmitting power. System default is 100%.
- > Idle Time Manually force the Idle Time using a selected value. The default is 300.

#### 4.2 Access Control

Click the **Access Control** tab of the utility and the **Access Control** screen will appear as Figure 4-4. In this page, you can enable/disable the AP to connect with the specified Mac address.

RL51 Wireless	Lite-N Client Utility	×
Config Access Contr	Mac Table   Event Log   Statistics   About	
Access Policy	Disable	
MAC Address	Disable Allow All	
	Reject All	
	Add	
	Delete	
	Remove All	
	Apply	

Figure 4-4 Access Control Function

- > Access Policy This field allows you to start the function or not. System default is disabled.
  - **Disable -** Disable the Access Policy feature.
  - Allow All Allow all the MAC addresses in the Access List to access the AP.
  - Reject All Disable all the MAC addresses in the Access List to access the AP.
- Mac Address Manually force the Mac address using the function, and press Add to Access List.
- > Access List Display all Mac Addresses that the user has set.

#### 4.3 Mac Table

Figure 4-5 shows the link status page. It displays detailed station information of current connection.

PW-DN427

MAC Address	AID	Power S	Status	
a 1				
<				>

#### Figure 4-5 Mac Table Function

- > MAC Address The station's Mac address of the current connection.
- > **AID** Raise value by current connection.
- Power Saving Mode Support Power Saving Mode on the currently connected station.  $\triangleright$
- Status The link status of the current connection.  $\geq$

#### 4.4 Event Log

A record of all event times and messages, shown as below.

Config         Access Control         Mac Table         Event Log         Statistics         About           Event Time (w/mm/dd-hh:mm:ss)         Message	4	RL51 Wireless Lite-N Clien	t Utility	X
2008 / 10 / 07 - 15 : 27 : 23       Restart Access Point         2008 / 10 / 07 - 15 : 38 : 02       Restart Access Point         2008 / 10 / 07 - 15 : 47 : 37       00-03-7F-8E-F1-03 associated         2008 / 10 / 07 - 15 : 54 : 05       00-03-7F-8E-F1-03 left this BSS	C	onfig Access Control Mac Table	vent Log	
2008 / 10 / 07 - 15 : 27 : 23       Restart Access Point         2008 / 10 / 07 - 15 : 38 : 02       Restart Access Point         2008 / 10 / 07 - 15 : 47 : 37       00-03-7F-8E-F1-03 associated         2008 / 10 / 07 - 15 : 54 : 05       00-03-7F-8E-F1-03 left this BSS		Event Time (vv/mm/dd- hh:mm:ss)	Message	
2008 / 10 / 07 · 15 : 47 : 37 2008 / 10 / 07 · 15 : 54 : 05 00-03-7F-BE-F1-03 left this BSS 00-03-7F-BE-F1-03 left this BSS				
2008 / 10 / 07 - 15 : 54 : 05 00-03-7F-BE-F1-03 left this BSS				
		2008710707-15:54:05	00-03-7F-BE-F1-03 left this B55	
Clear				
Clear				
Clear				
Clear				
				Clear
	—			

#### Figure 4-6 Event Log Page

- > Event Time (yy/mm/dd-hh:mm:ss) Displays the event time recorded.
- > Message Displays all event messages.

#### 4.5 Statistics

The statistics page displays detailed counter information based on the 802.11 MIB counters. The information is translated into a format easier for the user to understand.

🖡 RL51 Wireless Lite-N	Client Utility		
Config Access Control Mac Ta	able Event Log St	atistics About	
- Transmit Statistics			
Frames Transmitted Succe	ssfully	=	1420
Frames Fail To Receive A(	CK After All Retries	=	0
RTS Frames Successfully	Receive CTS	=	0
RTS Frames Fail To Recei	ve CTS	=	0
Frames Transmitted Succe	ssfully After Retry	=	0
Receive Statistics			
Frames Received Succes	•	=	63
Frames Received With CF	C Error	=	253939
Frames Dropped Due To (	Dut-of-Resource	=	- -
Duplicate Frames Receive	ed	=	0
			RESET COUNTERS
			RESET COUNTERS

Figure 4-7 Transmit and Receive statistics

#### 4.6 About

The About page displays the wireless card and driver version information as shown in Figure 4-8.

PW-DN427

7 Wireless Lite-N USB Adapter User Guide

👍 RI	51 Wireless Lite-	N Client Utility	/		X
Confi	ig Access Control Ma	c Table   Event Log	] Statistics About		
	Copyright (c) 2008, TP	LINK TECHNOLOG	ilES CO., LTD. All Righ	its Reserved.	
	Utility Version :	2.0.6.0	Date :	12-03-2009	
	Driver Version :	1.3.0.0	Date :	06-17-2009	
	EEPROM Version :	1.0	Firmware Version :	0.12	
	IP Address :	0.0.0.0	Phy_Address :	00-0C-43-30-70-05	
	Sub Mask :	0.0.0.0	Default Gateway :		
	<u></u>				

Figure 4-8 About Page

## **Chapter 5** Example for Application

#### 5.1 Configuration of PSP XLink Online game

Please ensure the software and hardware environments are well established before configuring. For hardware, at least a PC, a PW-DN427 Wireless Lite-N USB Adapter and a PSP device are needed. For software, the PW-DN427 Adapter driver should be properly installed.

Please operate as follows:

- **Step 1.** Connect the website of X-LINK <u>http://www.teamxlink.co.uk</u> to register, and download the latest software of X-LINK Kai.
- Step 2. Install the X-LINK Kai software, click Start > All programs > XLink Kai > Configure Kai, then set as Figure 5-1.

🧏 XLink Kai Conf	iguration Tool 🛛 🛛 🔀
kaiUI.exe S Launch UI	efault Profiles elect a profile, the template will be pplied over your settings. Select a profile
Configuration Items Kai Port 30000 Kai Deep Port 30000 ✓ Enable PAT ○ XBox Homebrew ○ Follow PSP SSID ○ Auto Open Chat	<ul> <li>PSSDK</li> <li>Winpcap</li> <li>Network Adapter</li> <li>150Mbps Wireless Lite</li> <li>Show dangerous NICs</li> <li>Default XT ag (Username)</li> <li>Default Password</li> <li>Auto Login</li> <li>Close Engine After</li> <li>Never</li> <li>Close Engine when UI Closes</li> <li>Allow Remote UI Connections</li> <li>Help</li> <li>OK</li> <li>7.3.1.7</li> </ul>

Figure 5-1

- Step 3. After completing the settings, please click Start > All programs > XLink Kai > Start Kai to connect to XLink Kai.
- Step 4. Open the wireless mode of the PSP device, then start an internet game.

Step 5. Right-click "My Computer" and select Management. In the prompt page, click Device Manager, then right-click "150M Wireless Lite-N Client Adapter "and select Properties. Then set the value of "PSP Xlink Mode" as Enable following the red marked instruction in the figure.

📙 Computer Management		RL51 Wireless Lite-N Client Utility	X
🛄 File Action View Window He	elp	General Advanced Driver Details	
Computer Management (Local) System Tools Event Viewer Shared Folders Cocal Users and Groups Performance Logs and Alerts Device Manager Storage Cocal Storage Disk Defragmenter Disk Management Sorvices and Applications	Image: Second state of the second s		Ģ
	· • • • • •	OK Cance	:

Figure 5-2

Step 6. Click Start > Control Panel > Network.



Figure 5-3

Step 7. Right-click Wireless Network Connection icon  $2^{-1}$ , and select Properties. In the following prompt page, highlight Internet Protocol(TCP/IP) and click Properties.

This connection uses	the following items:							
🗹 🐨 Realtek EAF	🗹 🐨 Realtek EAPPkt Protocol 🔗							
AEGIS Proto	col (IEEE 802.1x) v3.4.5.0							
🗹 🐨 Internet Prot	ocol (TCP/IP)	~						
<								
l <u>n</u> stall	<u>U</u> ninstall	P <u>r</u> operties						
Description								
Allows your computer to access resources on a Microsoft network.								

Figure 5-4

**Step 8.** In the prompt page shown below, select **Use the Following IP Address**, and set the IP and Subnet mask. After completing setting, click **OK**.

Internet Protocol (TCP/IP) Prope	rties 🛛 🛛 🔀						
General							
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.							
O <u>O</u> btain an IP address automatically	y						
<ul> <li>Use the following IP address:</li> <li>IP address:</li> </ul>	192 . 168 3 86						
S <u>u</u> bnet mask:	255 . 255 . 255 . 0						
Default gateway:							
Obtain DNS server address autom	natically						
Output the following DNS server add ■ Output the following DNS server add	resses:						
Preferred DNS server:							
<u>A</u> lternate DNS server:	· · ·						
Ad <u>v</u> anced							
	OK Cancel						

Figure 5-5

#### Solution Note:

Please set the IP address in different network segment with the other network card to avoid conflict.

**Step 9.** Launch RL51 Wireless Lite-N Client Utility, then highlight the Network Name (SSID) beginning with "PSP" in the "Network" page, and click **Connect**.

Profile	s Lite-N Clie	Advanced	Stati	stics	Ø WPS	Radio On/Off	About.	
Sorted by >	> <b>()</b>	SID	Chan		Signal P List >> —		Show dBm	
chenyancher	nyan		Крз	<b>B90</b> (		-		
PSP_AULJM	05500_L_MHP2Q0	000	6	69 (	100%			
Rescan	Add	to Profile	Conn	ant				
Rescan	Add	to Profile	Conn	ect				

Figure 5-6

Step 10. Check whether your PSP device is detected in the Diagnostics mode of Kai as Figure

5-7 shown: Click the icon  $\checkmark$  first and then click the folder  $\circlearrowright$ .

🔩 XLink K	ai Evolution VII	_ 🗆 🗙
()	Diagnostics Mode 😫 XLink Kai is Online	
6	Sony PSP, configured successfully.	
	Your PSP MAC Addres	8

Figure 5-7

**Step 11.** Click the icon on the right top corner to enter the Arena Mode, highlight the arena of your wanted game, and then join or start a new game.



Figure 5-8

## Appendix A: Glossary

**802.11b** - The 802.11b standard specifies a wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.

**802.11g** - Specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.

**Ad-hoc Network -** An ad-hoc network is a group of computers, each with a wireless adapter, connected as an independent 802.11 wireless LAN. Ad-hoc wireless computers operate on a peer-to-peer basis, communicating directly with each other without the use of an access point. Ad-hoc mode is also referred to as an Independent Basic Service Set (IBSS) or as peer-to-peer mode, and is useful at a departmental scale or SOHO operation.

**DSSS** (Direct-Sequence Spread Spectrum) - DSSS generates a redundant bit pattern for all data transmitted. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers. However, to an intended receiver (i.e. another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).

**FHSS** (Frequency Hopping Spread Spectrum) - FHSS continuously changes (hops) the carrier frequency of a conventional carrier several times per second according to a pseudo-random set of channels. Because a fixed frequency is not used, and only the transmitter and receiver know the hop patterns, interception of FHSS is extremely difficult.

**Infrastructure Network -** An infrastructure network is a group of computers or other devices, each with a wireless adapter, connected as an 802.11 wireless LAN. In infrastructure mode, the wireless devices communicate with each other and to a wired network by first going through an access point. An infrastructure wireless network connected to a wired network is referred to as a Basic Service Set (BSS). A set of two or more BSS in a single network is referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

**Spread Spectrum -** Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread-spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread

Spectrum (FHSS).

**SSID** - A Service Set Identification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name.

**WEP** (Wired Equivalent Privacy) - A data privacy mechanism based on a 64-bit or 128-bit shared key algorithm, as described in the IEEE 802.11 standard.

**Wi-Fi** - A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among 802.11b devices.

**WLAN** (Wireless Local Area Network) - A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.

**WPA** (**W**i-Fi **P**rotected **A**ccess) - A wireless security protocol use TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.

## Appendix B: Specifications

General	
Interface	USB 2.0 Connector
Standards	IEEE 802.11n, IEEE 802.11g, IEEE 802.11b
Operating System	Windows 2000/ XP/ Vista/ 7
Safety & Emission	FCC, CE
Frequency	2.4 ~ 2.4835 GHz
	130M: -68dBm
Sensitivity	54M: -68dBm
	11M: -85dBm
Spread Spectrum	Direct Sequence Spread Spectrum (DSSS)
Wireless	
Radio Data Rate	Up to 150Mbps
Modulation	11n OFDM, 11g OFDM , 11b CCK/DSSS
Media Access Protocol	CSMA/CA with ACK
Data Security	WPA, 64/128 bit WEP, TKIP/AES, IEEE 802.1X authentication

Physical Environmental	
Working Temperature	0℃~40℃ (32°F~104°F)
Storage Temperature	-40°C~70°C (-40°F~158°F)
Humidity	10% $\sim$ 90% RH, Non-condensing