123 Manual, LP-288ai V2.0 TURBO OFDM Compact outdoor radio with throughput booster. INSTALLATION IN POINT TO POINT, POINT TO MULTI-POINT MODE. FIRMWARE V2.0.1B2P4

LP288aiV21B2\_M123\_END01W



123 Manual, LP-288ai V2.0 TURBO OFDM Compact outdoor radio with throughput booster. INSTALLATION IN POINT TO POINT, POINT TO MULTI-POINT MODE. FIRMWARE V2.0.1B2P4



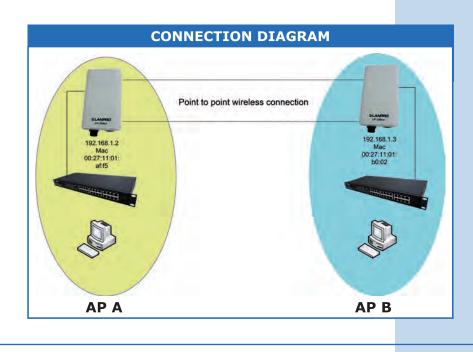


Figure 1

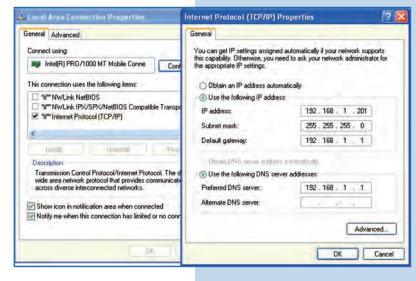
Go to the properties of your network card and select **Internet Protocol (TCP/IP)** and then **Properties**, as shown in **Figure 1**.

A RAILER CONTRACTOR		
Intel(R) PR0/100	0 MT Mobile Conne	Configure
This connection uses the	e following items:	
ST NWLink NetBI	DS	1
	PX/NetBIOS Compati	ble Transport Prot
Internet Protoci	H (TCP/IP)	
<		>
Install	Unestat	Properties
Description		
Transmission Control I wide area network pro across diverse interco	stocol that provides co	
Show icon in notifical	tion area when conne	cted
	connection has limited	or no connectivity
Notify me when this c	onnection nas inniced	

2

1

Select **Use the following IP address** and type an IP address in the LP-288ai IP range by default. For this example we have selected the address **192.168.1.201**, the LP-288ai has 192.168.1.2 by default. In **Subnet mask** type **255.255.255.0**, as shown in **Figure 2**.



Once you have finished select  $\mathbf{OK}$  twice.

For this configuration you will need the equipment MAC Addresses for point to point connection. Additionally, two different IP addresses will be used within the range to manage them.

In order to verify the MAC Addresses you shall access each LP-288ai and check it in **System Status** window. To do so:

**a.** Prepare the cable with the connector, as shown in **Figures 3a-1**, **3a-2**, and **3a-3**.











Figure 3a-3

**b**. Connect the cable as shown in **Figure 3b**.



DOWER ETHERNET

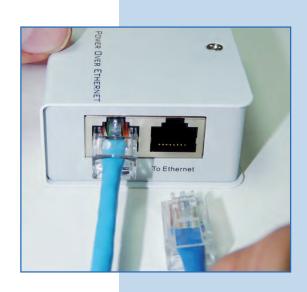
www.lanpro.com

Figure 3b

**c.** Connect the POE as shown in **Figure 3c**.

Figure 3c

**d.** Connect your PC or switch to the LP-288ai POE, as shown in **Figure 3d**.



e. Connect to electric power, as shown in Figure 3e.



Figure 3e

Figure 3d

**f.** Open the web browser of your preference and type the default address **192.168.1.2**, as shown in **Figure 3f**.

Internet Explorer cannot display the webpage - Windows Internet Explorer					A second s	
G	0.	- 2	http://192.1	68.1.2/		~
File	Edit	View	Favorites	Tools	Help	

Figure 3f

**g.** The equipment will request a user and a password. The LP-288ai has two user levels, one with all the privileges, which is **super** by default with **super** as password, and another one with fewer privileges with **admin** as user and **admin** as password. Type **super** in user and password and select **OK**, as shown in **Figure 3g.** 

The server 192.16i and password.	8.1.2 at Secure Realm requires a username
	8.1.2 at Secure Realm requires a username
Concentration of the last	
	er is requesting that your username and in an insecure manner (basic authentication onnection).
User name:	🖸 super 💌
Password:	
	Remember my password

 h. In the initial window (System Status), take note of the MAC Addresses of the first equipment, as shown in Figure 3f. Repeat this procedure with the second LP-288ai (From step a to h).

ent,	SLANPRO	Status ->System Status	Reboot
vith	Basic	Panel Uptime:	Day 0, 0:19:40
	Site Survey	Device Name:	
	Administration	Admin user Name:	admin
	HTTP Server	IP Mode:	Static IP Mode
	IP Configuration	IP Address:	192.168.1.2
		Subnet Mask:	255.255.255.0
	Operation Mode	Gateway Address:	0.0.0.0
	Remote AP List		
	Statistics		
	SNTP Setting		
		SSID:	Wireless
	Advanced	Wireless Mode:	11a
	Radio Setting	Radio Data Rate:	best
	Security Setting	Radio Frequency:	and the second
	MAC Addr Control	Radio Channel Width:	20MHz
	Protocol Filter	Operation Mode:	Access Point
	SNMP Configuration	Radio Power:	20 dBm
	Miscellaneous		
3h	Qos Setting	Security Method:	None
	Vian Setting	System MAC Address:	00:27:11:01:af:f5
	System Log	System HAC Address.	00.27.11.01.01.15
	Pair Connection		
	Status	Association Status:	in-
	System Status	Association Status:	op
	Association Status		
	MAC Learning Table		

# **Equipment A**

Figure 3g

Reconnect the first equipment and proceed to access it, therefore you shall open the web browser of your preference and type the default IP address **192.168.1.2**, as shown in **Figure 4**.

*		68.1.2/	http://192.1	-		-
			Favorites		~	File

The equipment will request your user and password once again. Type **super** in user and password and select **OK**, as shown in **Figure 14g.** (If you changed the passwords, use the appropriate ones).

Connect to 192.	168.1.2	<u>? ×</u>
7	D	
The server 192.1 and password,	68.1.2 at Secure Realm require	es a username
	ver is requesting that your use t in an insecure manner (basic connection).	
User name:	🖸 super	•
Password:		
	Remember my passwo	rd
	ОК	Cancel

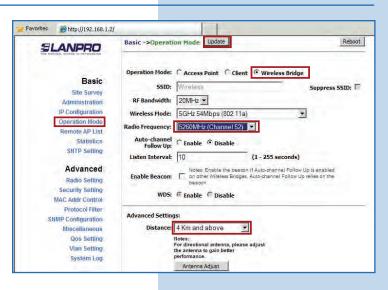
6

7

Select **Operation Mode** and then check **Wireless Bridge.** Select the channel in **Radio Frequency**, which will depend on the existing links and/or interferences (see **Appendix 1**). Additionally, we recommend adjusting the distance in the corresponding option (see **Appendix 2**) and click on **Update**, as shown in **Figure 6**.

Figure 6

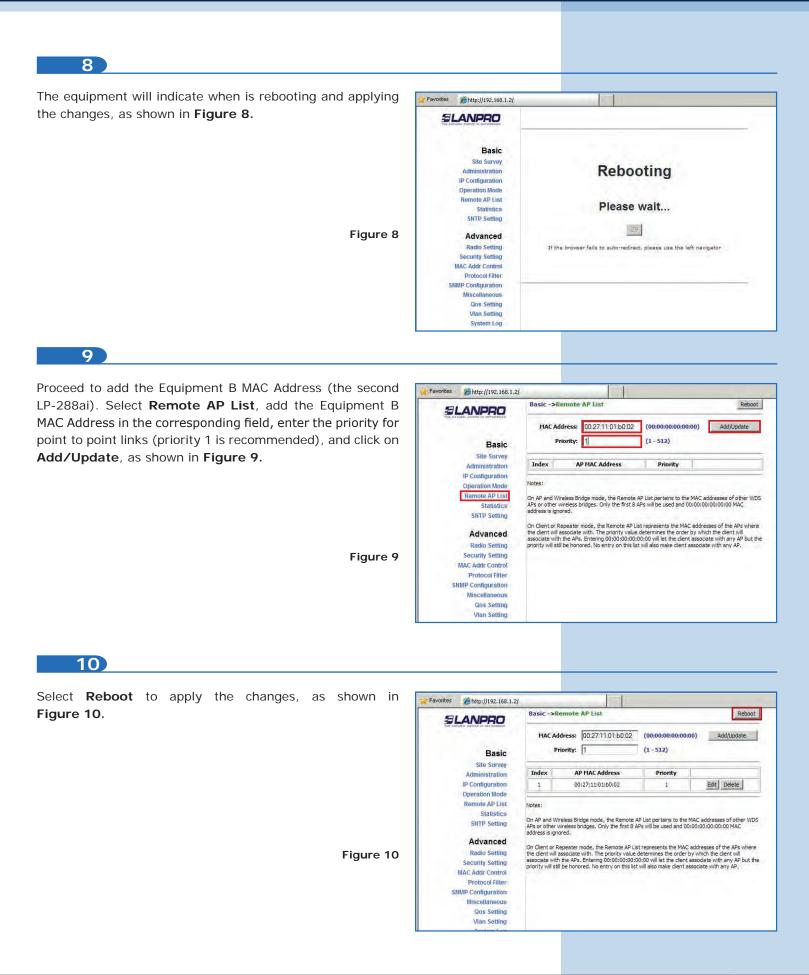
Figure 14g



The equipment will save changes, but they will not be effective unless you reboot it. Select **Reboot** as shown in **Figure 7.** 

SLANPRO	Basic ->Operation Mode Update Reboo Reminder: Please reboot for changes to take effect
Basic Site Survey Administration IP Configuration Operation Mode Remote AP List Statistics SITP Setting Advanced Radio Setting Security Setting MAC Addr Control	Operation Mode:       C Access Point       C Client       Wireless Bridge         SSID:       Wireless       Suppress SSID:       Suppress SSID:         RF Bandwidth:       20MHz       Suppress SSID:       Suppress SSID:         Wireless Mode:       5GHz 54Mbps (802,11a)       Image: Comparison of the suppress SSID:       Image: Comparison of the suppress SSID:       Image: Comparison of the suppress SSID:         Radio Frequency:       5560MHz (Channel 52)       Image: Comparison of the suppress SSID:       Image: Comparison of the superices SIG: Comparison of the super suppress SSID:       Image: Comparison of the super suppress SSID: <t< td=""></t<>
Protocol Filter SNMP Configuration	WDS: @ Enable @ Disable
Miscellaneous Qos Setting Vlan Setting System Log <b>Status</b> System Status	Advanced Settings: Distance: 4 Km and above Hotes: For directional antenna, please adjust the aitema to gain better performance. Antenna Adjust







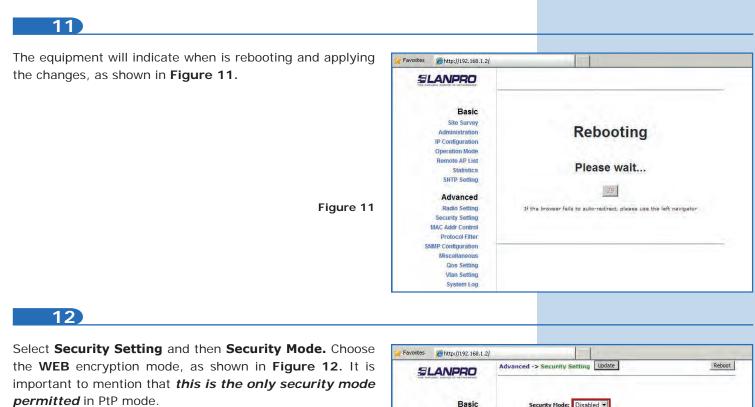
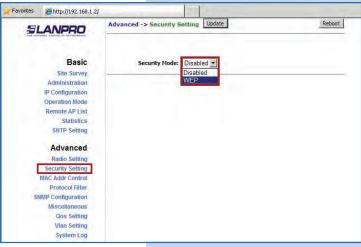


Figure 12

Figure 13



13

Select the authentication method, in this case **Shared Key,** then the key type (**Ascii Text**), enable key 1, enter it in **Encryption Key** and in **Key Length** select its length (in this case 128 bit). Click on **Update** to save changes, as shown in **Figure 13**.

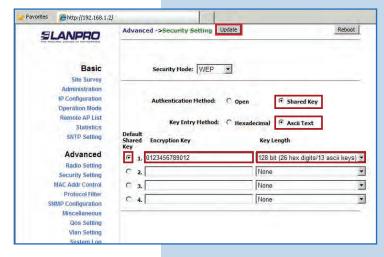


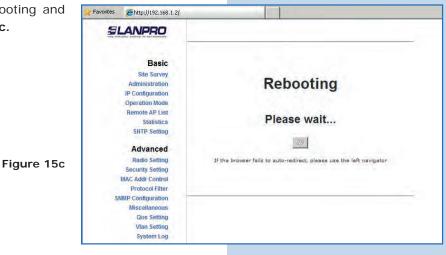


Figure 15b

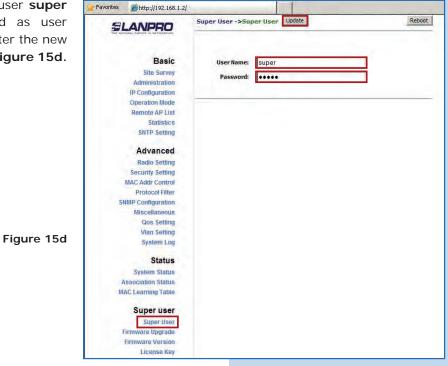
b. To apply changes select **Reboot**, as shown in Figure 15b.

SLANPRO	Basic ->Administra	tion Update Readers Please reboot for changes to take effect
Basic Site Survey Administration IP Configuration Operation Mode Remote AP List Statistics	Device Name: User Name: Password:	AP 2 admin

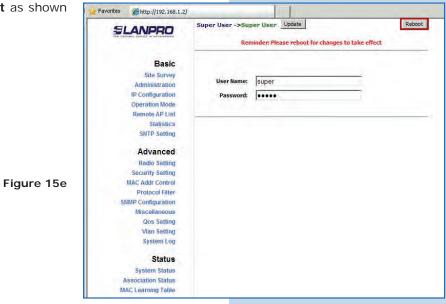
**c.** The equipment will indicate when is rebooting and applying the changes, as shown in **Figure 15c**.



d. Proceed to change the password of the user super (remember you have to be authenticated as user super). Select the option Super User and enter the new password, then click on Update as shown in Figure 15d.



 e. To make changes effective, select Reboot as shown in Figure 15e.



**f.** The equipment will indicate when is rebooting and applying the changes, as shown in **Figure 15f.** 

SLANPRO	
Basic	
Site Survey	Dehesting
Administration	Rebooting
IP Configuration Operation Mode	
Remote AP List	
Statistics	Please wait
SNTP Setting	
Sirit Sound	29
Advanced	23
Radio Setting	If the browser fails to auto-redirect, please use the left navigator
Security Setting	
MAC Addr Control	
Protocol Filter	
SNMP Configuration	
Miscellaneous	
Qos Setting	
Vlan Setting	
System Log	

**g.** The equipment will request your user and password once again. Enter the value you changed and select **OK**, as shown in **Figure 15g**.

Connect to 192.	168.1.2	<u>?</u> ×
7	G	
and password. Warning: This se	.68.1.2 at Secure Realm require	ername and
without a secure		authentication
User name:	Super	-
Password:	•••••	
	Remember my passwo	rd
	ОК	Cancel

Figure 15f

Figure 15g

## **Equipment B**

Proceed to connect the second LP-288ai and access it, therefore you shall open the web browser of your preference and type the default IP address **192.168.1.2**, as shown in **Figure 16**.

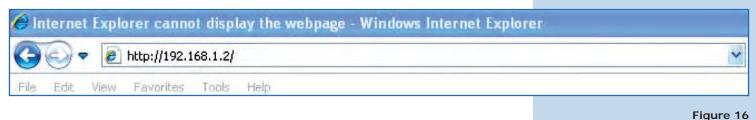


Figure 17

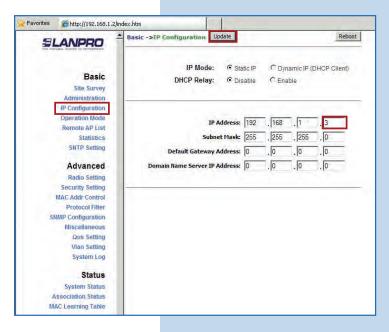
17

The equipment will request your user and password once again. Type **super** in user and password and select **OK**, as shown in **Figure 14g.** (If you changed the passwords, use the appropriate ones).

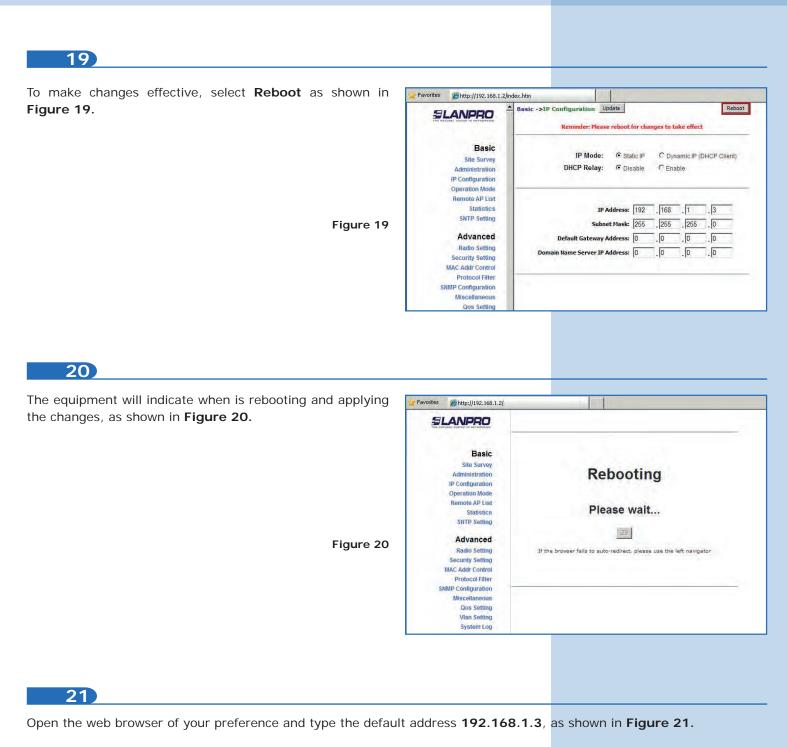


18

Proceed to change the Equipment B IP, which is **192.168.1.3** according to the diagram. To do so, select **IP Configuration**, enter 192.168.1.3 in the box **IP Address** and click on **Update**, as shown in **Figure 18**.







00-	🔊 http://192.168.1.3/	*
🚖 Favorites	Connecting	
		Figure



Figure 22

Figure 23

Figure 24

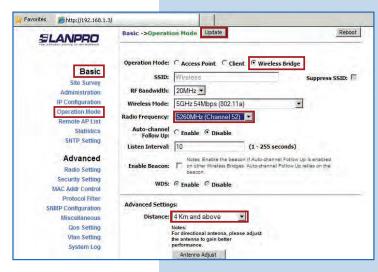
#### 22

The equipment will request your user and password once again. Enter the value you changed and select **OK**, as shown in **Figure 22**.

Connect to 192.1	168.1.3 <u>? ×</u>
The server 192.1 and password.	68,1.3 at Secure Realm requires a username
	ver is requesting that your username and t in an insecure manner (basic authentication connection).
User name;	🖸 super
Password:	
	Remember my password
	OK Cancel

23

Select **Operation Mode** and then check **Wireless Bridge**. Select the channel in **Radio Frequency**, which will depend on the existing links and/or interferences (see **Appendix 1**). Additionally, we recommend adjusting the distance in the corresponding option (see **Appendix 2**) and click on **Update**, as shown in **Figure 23**.

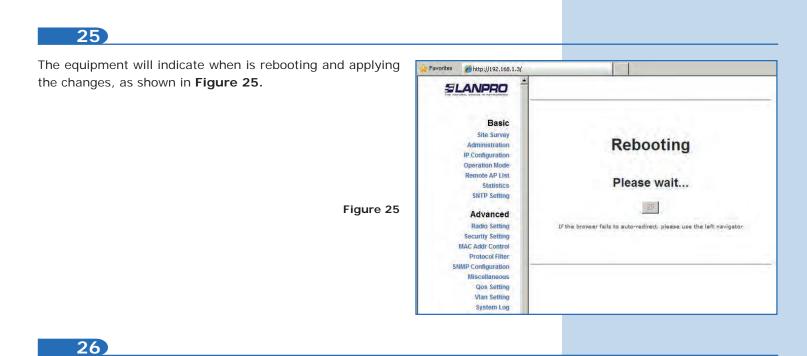


24

The equipment will save changes, but they will not be effective unless you reboot it. Select **Reboot** as shown in **Figure 24**.

SLANPRO	Basic ->Operation Mode Update Reminder: Please reboot for changes to take effect		
Basic Site Survey	Operation Mode: C Access Point C Client C Wireless Bridge		
Administration	SSID: Witeless SSID:		
IP Configuration			
Operation Mode	RF Bandwidth: 20MHz		
Remote AP List	Wireless Mode: 5GHz 54Mbps (802.11a)		
Statistics	Radio Frequency: 5260MHz (Channel 52) -		
SNTP Setting	Auto-channel Follow Up: C Enable © Disable		
Advanced	Listen Interval: 10 (1 - 255 seconds)		
Radio Setting	and a second sec		
Security Setting	Enable Beacon: on other Wireless Bridges, Auto-channel Follow Up is enabled		
MAC Addr Control	beacon.		
Protocol Filter	WDS: @ Enable @ Disable		
SNMP Configuration			
Miscellaneous	Advanced Settings:		
Qos Setting	Distance: 4 Km and above		
Vian Setting	Notes:		
System Log	For directional antenna, please adjust the antenna to gain better		
Status	performance.		
	Antenna Adjust		



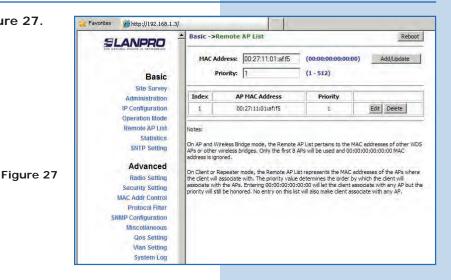


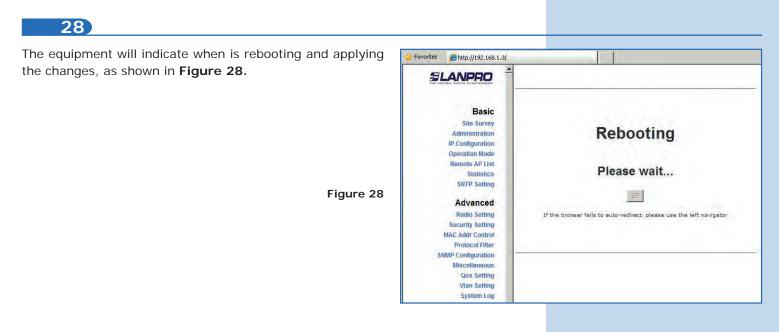
Proceed add the Equipment A MAC Address. Select **Remote AP List**, add the Equipment A MAC Address in the corresponding field, enter the priority for point to point links (priority 1 is recommended), and click on **Add/Update**, as shown in **Figure 26**.



27

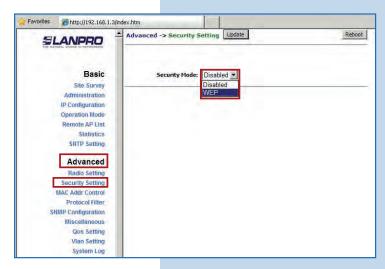
Select Reboot to apply changes, as shown in Figure 27.





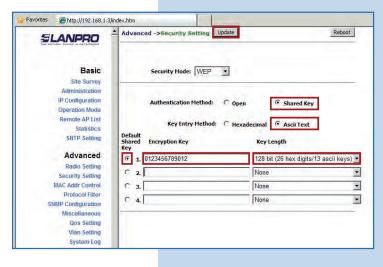
Select **Security Setting** and then **Security Mode.** Choose the **WEB** encryption mode, as shown in **Figure 29.** It is important to mention that *this is the only security mode permitted* in point to point and point to multi-point mode. (remember to enter the same security as Equipment A):

Figure 29

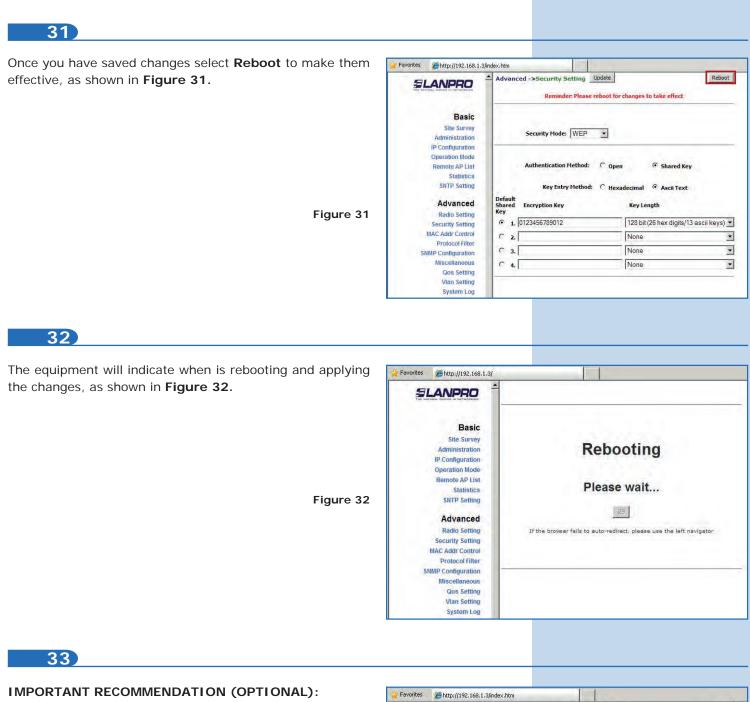


#### 30

Select the authentication method, in this case **Shared Key,** then the key type (**Ascii Text**), enable key 1, enter it in **Encryption Key** ad in **Key Length** select its length (in this case 128 bit). Click on **Update** to save changes, as shown in **Figure 30**.





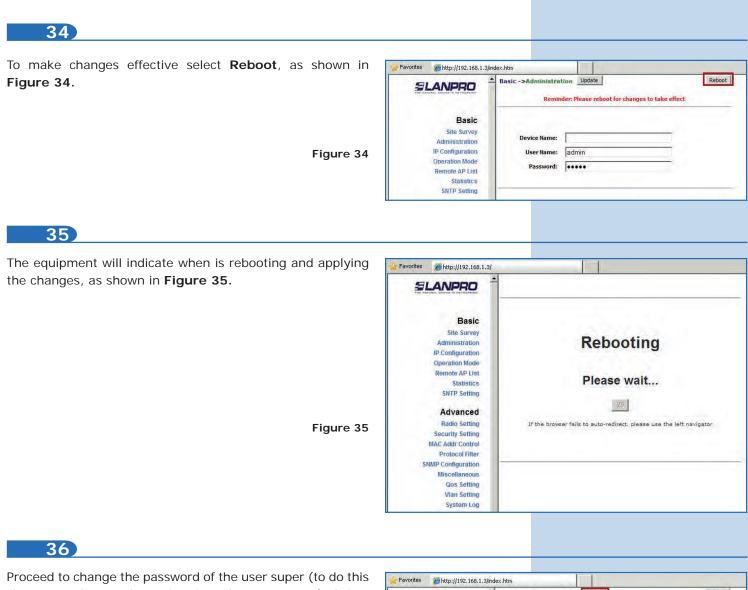


Proceed to change the password of the user **admin** and **super** of your equipment.

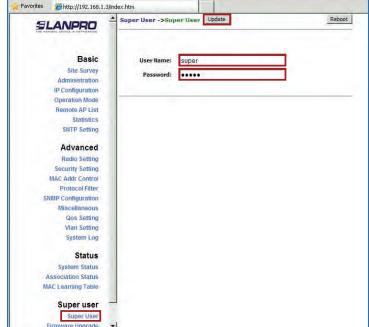
To **change** admin password, select **Administration** and enter the new password in the corresponding field, then select **Update** as shown in **Figure 33**.

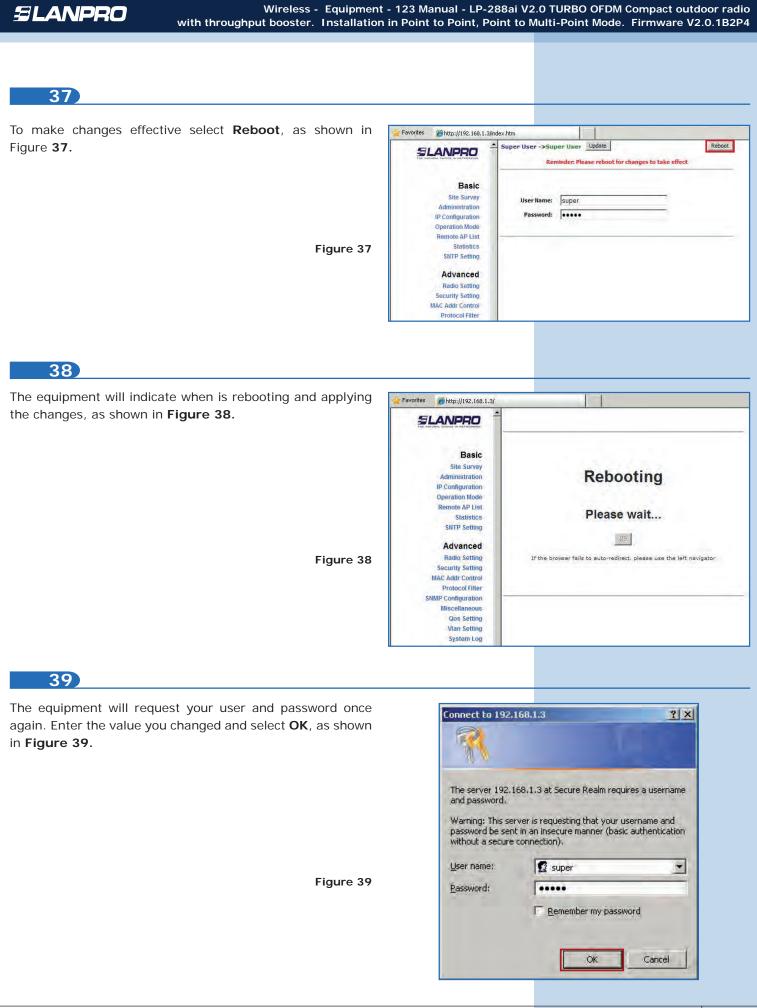
	Basic ->Administrat	Lion Update	Reboot
Basic	Device Name:		_
Site Survey Administration	User Name:	admin	
IP Configuration	Password:		
Operation Mode	Courses.		
Remote AP List			
Statistics			
SNTP Setting			
Advanced			
Radio Setting			
Security Setting			
MAC Addr Control			
Protocol Filter			





change you have to be authenticated as user super (to do this the option Super User and enter the new password, then click on Update as shown in **Figure 36**.

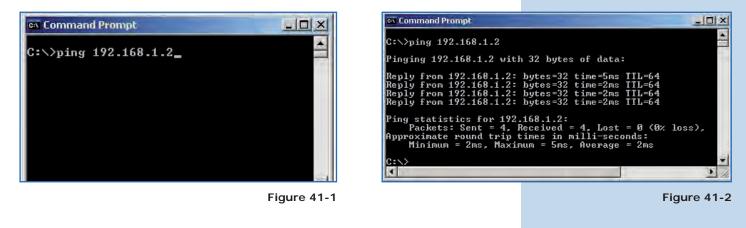




To check connectivity, execute the **Ping** command in a command window against the equipment IP you are connecting to (in this case **192.168.1.2**). To do so, select **Start** or **Inicio**, **Run** or **Ejecutar** as shown in **Figure 40-1**. Type the **cmd** command, as shown in **Figure 40-2**. Remember that the equipment has to be on.

W Paint	Printers and Faxes	Run	? >
Command Prompt	Help and Support Search	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.	
All Programs 🕨	<u>Run</u>	Open: cmd	*
_	Opens a program, folder	ок	Cancel Browse
Start 📴 🥑 🌽 »			
	Figure 40-1		Figure 40
41			

Type the **ping** command followed by the destination equipment IP (**192.168.1.2**) and press **Enter**. You will observe the answer of the destination equipment, as shown in **Figures 41-1** and **41-2**. In case you do not get any answer, please verify steps **7**, **9**, **12**, **13**, **23**, **26**, **29**, and **30**. Remember that the equipment has to be in the same frequency channel and have the same encryption mode and security key.



#### 42

• Appendix 1: Consider that the correct selection of the frequency channel is a vital factor for your wireless network performance. The LP-288ai equipment operates in ISM 5 GHz frequency band and it has more frequency channels which do NOT overlap each other (because of the spacing in frequency among channels). However, there is the possibility that where you are installing your wireless network other transmission sources in the 5 GHz band exist. As a consequence, the signal of your wireless network can be interfered by other devices if they operate in the same frequency channel in the 5 GHz band. To avoid this, you can make a network survey through the **Site Survey** option and detect which frequency channels are being used in the site. The idea is to select or configure your LP-288ai in the frequency channel that you see clear or not used. In the unlikely event that all the channels are busy, it is recommended to use the frequency channel which transmission power is the lowest in the site.

• Appendix 2: In Operation Mode page, Advanced Settings, there are several options for the Distance parameter. This one allows the user to select the approximate distance between the *AP* device and the *Slave* device (or between *AP* devices). In case you select the proper distance, the LP-288ai will handle the latency on a long distance path. This allows reducing the error rate and increasing the transmission speed.