

## Configuring the EN-2000's 802.11 Wireless Card

n addition to the EN-2000's wireless and cabled connections to a local area network (LAN), to a wide area network (WAN), and to peripheral devices and remote devices, the EN-2000 also supports 802.11a and 802.11n wireless (WiFi) protocols. This document discusses use of WiFi in the EN-2000.

The EN-2000's 5 GHz 802.11 wireless card or 2.4 GHz 802.11 wireless card was installed in its internal card slot (or both cards were installed in their slots) before the EN-2000 was shipped. Each of the EN-2000's 802.11 wireless cards can use one of the following operating modes:

- It can function as a wireless client.
- It can function as a wireless access point (including designation as a WiFi hotspot).

**Note:** A single 802.11 wireless card can support only one operating mode at a time.

See the following:

- Section 6.1, Setting Up the EN-2000, on page 1
- Section 6.2, Configuring an 802.11 Wireless Card in the EN-2000, on page 3
- Section 6.3, Configuring the 802.11 Wireless Card's Operating Mode, on page 12

Note: For standard EN-2000 configuration, see the document *Configuring the* EN-2000 for its Network Functions.

#### Setting Up the EN-2000 6.1

- 1 Place the EN-2000 in its network location, and attach antennas to the ports on the back of the chassis, to support the internal 802.11 wireless cards. (For details, see the EN-2000<sup>™</sup> Quick Installation Guide.)
- 2 Log into the EN-2000 management system. (For details, see Logging In, in the document Using the EN-2000's Management System.)
  - The EN-2000 Status Overview Screen (Figure 6-1) is the first screen displayed after you have logged onto the EN-2000 management system.

The status overview includes summaries of the LAN, WAN, and cellular wireless ports. Figure 6-1 also displays 802.11 wireless ports.

### Figure 6-1. EN-2000 Status Overview Screen

Status       System       Network       Logout       Quickstart         Overview       Routes       System Log       Realtime Graphs       Encl         Status       System       Device Name       Encl       Encl         Device Name       Encl       Encl       Encl         Operation Status       Online us       Encl       Encl         Callular Information       Ess       125 dbm       Encl         RSRQ       125 dbm       Encl       Unknown         APN       Net Availa       Unknown         APN       Net Availa       Inscene         Carrier       Unknown       Net Availa       Encl         PCI       O       Encl       Encl       Encl         INStitch Reason	tud Uptime: 24h 13m 18: Uptime: 24h 13m 18: 00 10 21:31:22 2018 ing WAN ************************************
Status     System     Network     Logout     Quickstart       Overview     Poutes     System Log     Realtime Graphs     Encl       Status     System     Device Name     EN 2000       Device Name     EN 2000     EN 2000       Firmware Version     17322 05       Build     2477w       Local Time     Wed Jan 1       Operation Status     Online us       Cellular Information     RSRP       RSRQ     -125 dB       Connection Type     Unknown       IMEI     35162207       SIM 1D     Met Avail       OR Registration Status     Met Avail       Carrier     Unknown       PCI     0       EARFCM     0       Registration Status     Net Regist       Module Name     LE30-EU       SIM Failback Status     Weak sign       SIM Failback Status     Weak sign       SIM Failback Status     Weak sign       Wireless     AR9342 802.11 an Radio       Mace Add     Protocol       Rhail     IP bata:       IP bata:     IP bata:       IP bata:     IP bata:       IP bata:     IP bata:       BSTD: SD: SD: SD: SD: SD: SD: SD: SD: SD: S	Cud Uptime: 24h 13m 18: Uptime: 24h 13m 18: 10 21:31:22 2018 ing WAN 11198259 bble SET: NA) Ele tered V2(FW: Not Available) nel 10 21:28:51 GMT 2018: Max retries reached in Backup state
Overview     Number     System       Device Name     EN2000       Device Name     Unit Status       Operation Status     Online us       Cellular Information     -104 dBm       RSRQ     -125 dBm       Cannection Type     Unknown       IMSI     -104 dAvaila       SIM STATUS     NA(CPUN S       IMSI     Unknown       PCI     0       Registration Status     Not Registing       Module Name     LE910-EU       SIM Failback Status     Wed Jan 3       Network     Status       Mac Add     Protocol       Work     EL       Uptime:     MAC -Add       Wireless     Status       AR9342 802.11 an Radio     Status       Mac - Add     Status       Index Na     Protocol       RX: 157:     EA       RA1     IP	000 Uptime: 24h 13m 18: 00 10 21:31:22 2018 ing WAN 1198259 ble SET: NA) bla tered V2( FW: Not Available) nal 10 21:28:51 GMT 2018: Max retries reached in Backup state
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MAC-Ad       CELL       Wireless     RS: 0.00       Wireless     MAC-Ad       Wireless     MAC-Ad       AR9342 802.11abgn Radio     SSID: 20       Machadia     SSID: 20       Machadia     SSID: 20       Machadia     SSID: 20	
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MAC-Adi Protocol RX: 25.9 Brian WAN RX: 157.1 IP Data: IPV4: 19 Link Sta Uptime: MAC-Adi Protocol RX: 157.1 E IPV4: 17 Link Sta IPV4: 17 IP Data: IPV4: 19 Link Sta IPV4: 17 IP Data: IPV4: 19 IIP Data: IPV4: 19 IIP Data: IPV4: 17 IIN Sta IPV4: 17 IIN Sta IN IN I	24h 13m 26s
Image: Constraint of the second se	dress: 00:A0:EB:80:A8:60 I: static
IX: 159.       IV       IV       IP       IP       IP       IV       IP        IP        IP	482 MB (268015 Pkts.)
IPv4: 19       Link Sta       WAN       WAN       Wan       Wan       Protoco       R: 157.       R: 157.       IPv4: 17       IPv4: 18       IPv4: 19       IPv4: 19       IPv4: 19       IPv4: 19       IPv4: 17       IPv4: 17       IPv4: 17       IPv4: 19       IPv4: 19   <	3908 MB (265726 Pkts.) : 191.5357 MB
WAN     Wan       WAN     Protocol       Wireless     TX: 14.3       Wireless     IP Vata:       AR9342.802.11an Radio     SSID: 90       Mede: Ma     Pa       AR9280.802.11abgn Radio     SSID: 90       Machanel     SSID: 90       AR9280.802.11abgn Radio     SSID: 90       Mode: Ma     Bitrate: 3       BSSID: 0     BSSID: 0	2.168.10.1/24
WAN RAC-Ad Protocol RX: 157.1 # # Wireless Wireless AR9342 802.11an Radio AR9342 802.11an Radio AR9342 802.11an Radio AR9342 802.11abgn Radio SSID: 0 AR9280 802.11abgn Radio SSID: 0 Rode: Ma	itus: 0P, 100Mbps, Full-Duplex
WAN     Protocol       Image: State of the state	10h 25m 6s dress: 00:A0:EB:80:A8:61
K: 15.7.       eth1       TX: 11.3.       IP Data:       IP v4: 17       Link Sta       Vireless       AR9342 802.11an Radio       Mode: Ma       AP       AR9280 802.11abgn Radio       SSID: 00       AR9280 802.11abgn Radio       SSID: 0       AR9280 802.11abgn Radio       SSID: 0       SSID: 0	I: dhcp
ethi IP Data: IP v4: 17 Link Sta Wireless AR9342 802.11an Radio SSID: 90 Mode: Ma Channel: Bitrate: 3 BSSID: 0 AR9280 802.11abgn Radio SSID: 90 Mode: Ma Channel: Bitrate: 3 BSSID: 0 BSSID: 0	8978 MB (250090 Pkts.) 937 MB (129061 Pkts.)
AR9342 802.11an Radio SSID: an Mode: Ma Bitrate: 3 SSID: 0 AR9280 802.11abgn Radio SSID: 30 AR9280 802.11abgn Radio SSID: 30 Mode: Ma Bitrate: 3 BSSID: 0 Bitrate: 3 BItrate:	170.3298 MB
Wireless AR9342 802.11an Radio SSID: en Hode: Ha Channel: Bitrate: 3 Bitrate:	2.17.1.51/24 tus: UP, 100Mbps, Full-Duplex
AR9342 802.11an Radio AR9342 802.11an Radio Mode: Ma Channel: Bitrate: 3 Bitrate: 3	
AR9:342:802.11an Radio AP AP AP AP AP AR9280:802.11abgn Radio AR9280:802.11abgn Radio SSID: 0 AR9280:802.11abgn Radio SSID: 0 Bitrate: 3 BSSID: 0 Bitrate: 3 Bitrate: 3 BSSID: 0 Bitrate: 3 BSSID: 0 Bitrate: 3 BSSID: 0 Bitrate: 3 Bitrate: 3 Bitrate	
AP Channel: Bitrate: 3 BSSID: 0 AR9280 802:11abgn Radio SSID: an AP Bitrate: 3 BSSID: 0 BSSID: 0 BSSID: 0 BSSID: 0 Bitrate: 3 BSSID: 0 BSSID:	core wfi60-59Hz Encryption: WPA2 PSK (AUTO)
AR9280 802.11abgn Radio SSID: 0 AR9280 802.11abgn Radio SSID: 9 AP Bitrate: 3 Bitrate: 3 Bitrate: 3 Bitrate: 3 Bitrate: 3	ACK Timeoutt 25
AR9280 802.11abgn Radio SSID: 0 Node: Ma Ap Bitrate: 3 BSSID: 0	aster ACK Timeout: 25 140 (5.700 GHz) DFS Status: Disabled
AK9200 002.11dbyll Kdolo SSID: 30 Hode: M Channel: Bitrate: 3 BSSID: 0	Ack Timeout: 25           140 (5.700 GHz)         DFS Status: Disabled           300 Mbit/s         Disabled
AP Bitrates 3 BSSID: 0	ACK Timeout: 25           140 (5.700 GHz)           DFS Status: Disabled           300 Mbit/s           10:AD:EB:00:AB:62
Bitrate: 3 BSSID: 0	ACK Timeout: 25           140 (5.700 GHz)         DFS Status: Disabled           300 Mbit/s         0:A0:E0:80:A8:62           core: wfi50: 2.4GHz         Encryption: WPA2 PSK (AUTO)           sater         ACK Timeout: 64
	Ster         ACK Immout: 25           140 (5.700 GHz)         DFS Status: Disabled           300 Mbit/s
- Accepted Station - (n)	Sater         ACK limeout: 25           140 (5.700 GHz)         DFS Status: Disabled           300 Mbit/s
- Associated Stations (0)	ACK Timeout: 25           140 (5.700 GHz)         DFS Status: Disabled           300 Mbit/s         0:A0:EB:80:A8:62           core: wfi60: 2.4GHz         Encryption: WPA2 PSK (AUTO)           sater         ACK Timeout: 64           11 (2.452 GHz)         DFS Status: Disabled           300 Mbit/s         0:a0:EB:80:A8:63
MAC-Address Network Device Name	ACK Timeout: 25 140 (5.700 GHz) DFS Status: Disabled 300 Mbit/s 0xA0:ED:80:A8:62 core wfi50 .2.4GHz Encryption: WPA2 PSK (AUTO) sater ACK Timeout: 64 11 (2.452 GHz) DFS Status: Disabled 300 Mbit/s 10:A0:EB:80:A8:63
No information avail	ACK Timeout: 23 140 (5.700 GHz) DFS Status: Disabled 300 Mbit/s 101A0:EB:80:AB:62 tore wifi60 2.4GHz ster ACK Timeout: 64 11 (2.462 GHz) DFS Status: Disabled 300 Mbit/s 101A0:EB:80:AB:63 Last IP Signal Signal/Chains Noise TX Rate RX Rate TX-CCQ
DHCP Leases	ACK Timeout: 25 140 (5.700 GHz) DFS Status: Disabled 300 Mbit/s 101A0:EB:80:AB:82 core wif60 2.4GHz sater ACK Timeout: 64 11 (2.462 GHz) DFS Status: Disabled 300 Mbit/s 101A0:EB:80:AB:63 Last IP Signal Signal/Chains Noise TX Rate RX Rate TX-CCQ lable
Hostname IPv4-Address	ACK Timeout: 25 140 (5.700 GHz) DFS Status: Disabled 300 Mbit/s 101A0:ED:80:AB:62 core wif60 2.4GHz sater ACK Timeout: 64 11 (2.462 GHz) DFS Status: Disabled 300 Mbit/s 101A0:EB:80:AB:63 Last IP Signal Signal/Chains Noise TX Rate RX Rate TX-CCQ lable
	ACK Timeout: 25 140 (5.700 GHz) DFS Status: Disabled 300 Mbit/s 101A0:ED:80:AB:62 core wif60 2.4GHz sater 11 (2.462 GHz) DFS Status: Disabled 300 Mbit/s 101A0:EB:80:AB:63 Least IP Signal Signal/Chains Noise TX Rate RX Rate TX-CCQ lable MAC-Address Leasetime remaining
	ACK Timeout: 23 140 (5.700 GHz) DFS Status: Disabled 300 Mbit/s 101A0 (5.700 GHz) DFS Status: Disabled 300 Mbit/s 101A0: EB: 801AB: 63 Last IP Signal Signal/Chains Noise TX Rate RX Rate TX-CCQ lable MAC-Address Leasetime remaining There are no patient laster

# 6.2 Configuring an 802.11 Wireless Card in the EN-2000

Use the following steps to configure an 802.11 wireless card.

**Note:** Confer with your network administrator to determine values for parameters.

- 1 To see the 802.11 wireless network interfaces, select the EN-2000 management system's **Network** tab; then select the **Wifi** tab.
  - The screen for 802.11 Wireless Network Interfaces is displayed (Figure 6-2).

encor	EN 2000 Phone/MTN#: Device Mode; Cell Failover Auto Refresh: on				Changes:
Status Interface Advance	System Network Logout Quickstart Wifi Hotspot Failover Diagnostics Firewall OpenVPN DHCP and DN OVerview	IS VPN	VRRP S	erial DMNR	EnCloud
(AP)	AR9342 802.11an Radio Channel: 153 (5.765 GHz)   Bitrate: 300 Mbit/s			Spectrum	Add
	SSID: encore_wifi60_5GHz   Mode: Master 100% BSSID: 00:A0:EB:80:A8:62   Encryption: WPA2 PSK (AUTO)	۲	Disable	Z Edit	]
AP.	AR9280 802.11abgn Radio Channel: 11 (2.462 GHz)   Bitrate: 300 Mbit/s			Spectrum	🚵 Add
	SSID: encore_wifi60_2.4GHz   Mode: Master 100% BSSID: 00:A0:EB:80:A8:63   Encryption: WPA2 PSK (AUTO)	8	Disable	Z Edit	
Associa	ed Stations				
	MAC-Address Network Signal Signal/Chains	Noise	TX Rate	RX Rate	TX-CCQ
	No information available				

Figure 6-2. 802.11 Wireless Network Interfaces

**2** To revise settings for an 802.11 wireless card, select the **Edit** button at the end of that card's row.

The Wireless Network Configuration Screen is displayed (Figure 6-3).

atus System Network Logout	Quickstart	
erfaces Wifi Hotspot Failover Dia	gnostics Firewall OpenVPN DHCP	and DNS VPN VRRP Serial DMNR EnCloud
vanced		
reless Network: Master "encore_	wifi60_5GHz" (ath0)	
Device Configuration section covers physic red among all defined wireless networks (	al settings of the radio hardware such if the radio hardware is multi-SSID capa	as channel, transmit power or antenna selection which able). Per network settings like encryption or operation
evice Configuration		
Seneral Setup Advanced Settings		
Status	Mode: Master   SS BSSID: 00:A0:EB: Channel: 124 (5.6: 100% Signal: -95 dBm   Bitrate: 300.0 Mbit	ID: encore_wifi60_5GHz 80:A8:62   Encryption: WPA2 P5K (CCMP) 20 GHz)   Tx-Power: 24 dBm Noise: -95 dBm t/s   Country: United Kingdom
Wireless network is enabled	i Disable	
Country Code	No Country	~
Wireless Profile	802.11a+n	v
Channel Spectrum Width	20/40 MHz	¥
Channel	Auto	<b>v</b>
Obey Regulatory Power		
Antenna Gain (dBi)	0	
fransmit Power	Max	X
Outdoor Channels		
eneral Setup Winders Security MAC-Fil	ter   [Advanced Settings]	
lode	Access Point	V
SSID	encore_wifi60_5GHz	
uard Interval	Short	×
ata Rate (Mbps)	Auto	<b>v</b>
lide ESSID		
letwork	O cell:	
	🖲 lan: 🥶 💇 🕸 🌚	
	🔘 🛛 wan: 🗾	
	Choose the network you wa	ant to attach to this wireless interface.

Figure 6-3. Wireless Network Configuration Screen

There are two parts to 802.11 wireless configuration:

- Section 6.2.1, WiFi Device Configuration, on page 4
- Section 6.2.2, WiFi Interface Configuration, on page 7

## 6.2.1 WiFi Device Configuration

- **3** In the top portion of the Wireless Network Configuration Screen, under the heading **Device Configuration**, make sure the **General Setup** tab is selected.
  - The Wireless Network Configuration Screen displays parameters for general configuration of the 802.11 wireless device (Figure 6-4).

#### Figure 6-4. Wireless Network Configuration Screen, General Setup for Device Configuration

SOL CIMOIKS			
atus System Network Logout			
terfaces Wifi Hotspot Failover Dia	gnostics Firewall OpenVPN DHCP		Cloud
Ivanced			
reless Network: Master "encore_	wifi60_5GHz" (ath0)		
Device Configuration section covers physic red among all defined wireless networks ( de are grouped in the Interface Configuration)	al settings of the radio hardware such if the radio hardware is multi-SSID cap on.	as channel, transmit power or antenna selectio able). Per network settings like encryption or op	n which is peration
evice Configuration			
General Setup Advanced Settings			
Status	Mode: Master   S: BSSID: 00:A0:EB Channel: 124 (5:6 Signal: -95 dBm   Bitrate: 300.0 Mb	SID: encore_wifi60_5GHz 80:A8:62   Encryption: WPA2 P5K (CCMP) 20 GH2)   Tx-Power: 24 dBm Noise: -95 dBm t/s   Country: United Kingdom	
Wireless network is enabled	i Disable		
Country Code	No Country	~	
Wireless Profile	802.11a+n	v	
Channel Spectrum Width	20/40 MHz	(v)	
Channel	Auto	<u>v</u>	
Obey Regulatory Power			
Antenna Gain (dBi)	Ø		
Transmit Power	Max	×	
Outdoor Channels			
			0000000
nterface Configuration	16		
Mode	Access Point		
ESSID	encore wifi60 5GHz		
Suard Interval	Short	×	
Data Rate (Mbps)	Auto	×	
fide ESSID			
Network	O cell: 🖉		
	🖲 lan: 👜 💯 👰 👰		
	🔿 🛛 wan: 🗾		
	🔞 Choose the network you w	ant to attach to this wireless interface.	

**Note:** The **Status** display at the top of the **Device Configuration** pane is only for information.

- **4** On the Wireless Network Configuration Screen, General Setup for Device Configuration, do the following:
  - a Make sure the Wireless Network is Enabled.

**Note:** If the parameter name is **Wireless Network is Enabled**, the network is already enabled. **Disable** is displayed merely as a selection.

- **b** Select the **Country Code** for the device's location.
- c Select a value for the Wireless Profile.
- d Select the Channel Spectrum Width.
- e Leave the Channel on Auto.
- f Check the box to Obey Regulatory Power.
- g Set the Antenna Gain.
- **h** For **Transmit Power**, select **Max** to use the maximum value allowed under your region's regulations.

i Indicate whether to use Outdoor Channels.

- **5** After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).
  - The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.
- 6 Under the heading **Device Configuration**, select the **Advanced Settings** tab.
  - The Wireless Network Configuration Screen displays parameters for advanced configuration of the 802.11 wireless device (Figure 6-5).

Device Mode: Cell Failover Cell Signal: 12508m Operation Status: Online using WAN   Auto Refres	
atus System Network Logout Quickstart	
terfaces Wifi Hostnames Static Routes Failover Firewall Diagnos	
reless Network: Master "encore_wifi" (ath0)	
Device Configuration section covers physical settings of the radio hardware such a peed in the Interface Configuration.	is channel, transmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode
evice Configuration	
General Setup Advanced Settings	
Distance Optimization (Auto-ACK Timeout)	🗐 👔 Per Point to Multi-Point customers, please disable this Auto-ACK Timeout and select the furthest distance of the client to this device. Or else, it would cause unstability
Distance (meters)	
Chainmask Selection	2x2
Beacon Interval	100
Adaptive noise immunity	Controls radio sensitivity in the face of noise sources
Dynamic channel selection	Automatically switches channel to avoid interference
nterface Configuration	
General Setup Wireless Security MAC-Filter Advanced Settings	
RTS Threshold	2346
Station Isolation	🔲 😳 Prevents station-to-station communication
Maximum Stations	127
Minimum Stations RSSI	D
802.11n Only	
WMM	V 🚇 envises fuelts of Service Institute

Figure 6-5. Wireless Network Configuration Screen, Advanced Settings for Device Configuration

- 7 On that screen, do the following:
  - a Leave the box for Distance Optimization unchecked.
  - **b** Set the **Distance**.
  - c Indicate the Chainmask Selection.
  - d Set the Beacon Interval.
  - e Check the box for Adaptive Noise Immunity.
  - f Indicate whether to use Dynamic Channel Selection.
- 8 After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).
  - The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.

## 6.2.2 WiFi Interface Configuration

- 9 On the Wireless Network Configuration Screen, under the heading Interface Configuration (in the lower portion of the screen), make sure the General Setup tab is selected.
  - The Wireless Network Configuration Screen displays parameters for general configuration of the 802.11 wireless interface (Figure 6-6).

## Figure 6-6. 802.11 Wireless Configuration Screen for Advanced Device Setup and General Interface Setup

	etresh: on					
tatus System Network Logout	Quickstart					
nterfaces <mark>Wifi</mark> Hotspot Failover Di	agnostics Firewall OpenVPN DHCP an	d DNS VPN VRRP Serial DMNR EnCloud	Advanced			
ireless Network: Master "encore	_wifi60_5GHz" (ath0)					
e Device Configuration section covers physi nong all defined wireless networks (if the r e Interface Configuration.	cal settings of the radio hardware such as adio hardware is multi-SSID capable). Per	channel, transmit power or antenna selection which network settings like encryption or operation mode	h is shared are grouped i			
Device Configuration						
General Setup Advanced Settings						
Distance Optimization (Auto-ACK Timeout	) General General Content of Multi-Performance of the clip	int customers, please disable this Auto-ACK Timeout and ent to this device. Or else, it would cause unstability	i select the			
Distance (meters)	Min: 300, Max: 24000					
Chainmask Selection	2x2	×				
Beacon Interval	100	100				
Adaptive noise immunity	🗹 🥥 Controls radio sens	Controls radio sensitivity in the face of noise sources Sutomatically switches channel to avoid interference				
Dynamic channel selection	🗌 🗐 Automatically switch					
Interface Configuration						
General Setup Wireless Security MA	C-Filter Advanced Settings					
Mode	Access Point	×				
ESSID	encore_wifi60_5GHz					
Guard Interval	Short	V				
Data Rate (Mbps)	Auto	×				
Hide ESSID						
Network	O cell:					
	🖲 lan: 🛞 💯 🎯 🕸					
	O wan: 🗾					
	Choose the network yes	ou want to attach to this wireless interface.				

- **10** Do the following:
  - a For the Mode, select Access Point.
    - A default for the access point name (APN) displays in the field labeled ESSID. (If your EN-2000 uses a 5 GHz wireless module, the default name is encore\_wifi###, where ### represents the final three hexadecimal characters of the device's MAC address.)
  - **b** If you wish to use a different name for the access point, type that name into the field. (Check with your network administrator for the APN to enter here.)
  - c Set the value for the Guard Interval.
  - d Set the Data Rate.
  - e Leave the Hide ESSID box unchecked.
  - f Select the box to indicate that the Network is a LAN.
- **11** After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).

- The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.
- **12** Under the heading **Interface Configuration**, select the **Wireless Security** tab.
  - The Wireless Network Configuration Screen displays parameters to configure security for the 802.11 wireless interface (Figure 6-7).

Figure 6-7. Wireless Network Configuration Screen, Wireless Security

as System Network Innut Ovickstart			
erfaces Wiffi Hostnames Static Routes Failover Firewall Diagnostics QoS			
eless Network: Master "encore wifi" (ath0)			
Device Configuration section covers physical settings of the radio hardware such as channel,	transmit power or antenna selection which is share	d among all defined wireless networks (if the radio hardware is multi-SSID	capable). Per network settings like encryption or operation mode arr
sed in the Interface Configuration.			
eneral Setup Advanced Settings			
atus	Mode: Master   SS BSSID: 04:F0:21:1 Channel: 104 (5.32) Signal: -95 dbm   Bitrate: 300.0 Mbit,	Disnoore_wifi 181:36   Encryption: None Grid; ] Tx-Power: 24 dbm Golae: -55 dbm s   Country: No Country	
lineless network is enabled	Ø Disable		
ountry Code	No Country		
fireless Profile	802.11a+n		
hannel Spectrum Width	20/40 MHz		
hannel	Auto		
bey Regulatory Power			
ntenna Gain (dBi)	0		
ransm≷ Power	Max		
utdoor Channels			
terface Configuration			
eneral Setup Wireless Security MAC-Filter Advanced Settings			
xcryption	No Encryption	-	

- **13** On that screen, set the following values:
  - a By default, the EN-2000's 802.11 Encryption is set to no\_encryption. Set the encryption as directed by your network administrator. For example, select WPA2-PSK.
    - When you select anything other than no\_encryption, additional fields are displayed (Figure 6-8).

EN2000 LTE Router Phone Device Mode: Cell Failove Cell Signal - 12548m	e/MTN#: F		Unsaved Changes: 7
Operation Status: Online	using WAN		
Status System Network Logout Quickstart			
Interfaces Wifi Hostnames Static Routes Failover I	Firewall Diagnostics QoS VPN	I VRRP DMNR	
Wireless Network: Master "en2k2" (wifi0.netwo	rk2)		
The Device Configuration section covers physical settings of the networks (if the radio hardware is multi-SSID capable). Per networks (if the radio hardware is multi-SSID capable). Per networks (if the radio hardware is multi-SSID capable). The radio hardware is multi-SSID capable). The radio hardware is multi-SSID capable). Per networks (if the radio hardware is	e radio hardware such as channel, tr rork settings like encryption or oper-	ansmit power or antenna selection ation mode are grouped in the <i>Inter</i>	which is shared among all defined wireless face Configuration.
Encryption	WPA2-PSK		
Cipher	Auto		
Кеу	2	2	
			Reset Save Save & Apply

Figure 6-8. Additional Fields to Support 802.11 Wireless Encryption

- **14** Enter values to configure wireless security. The following example illustrates configuration for **WPA2-PSK** encryption.
  - a Make sure the Cipher is set to Auto.

**Note:** In automatic mode, the cipher uses CCMP (AES). Other protocols, such as TKIP, might appear in the list, but 802.11n recommends CCMP (AES).

- **b** For the **Key** field, specify a password for users to gain access to an 802.11 wireless network through this access point. Get this password from your network administrator.
- **15** After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).
  - The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.
- 16 Under the heading Interface Configuration, select the MAC Filter tab.
  - The Wireless Network Configuration Screen displays parameters to configure the MAC filter for the 802.11 wireless interface (Figure 6-9).

Figure 6-9. Wireless Network Configuration Screen, MAC Filter

EN2000 LTE Revider Phone/VTTN#: Device Mode: Cell FallerVTTN#: Cell Signal: 12548m Operation Status: Online using WAN   Auto Refrest: on		Changes
Status System Network Logout Quickstart		
Interfaces Wifi Hostnames Static Routes Failover Firewall Disgnostics QoS	VPN VRRP DMNR	
Wireless Network: Master "encore_wifi" (ath0)		
The Device Configuration section covers physical settings of the radio hardware such as channel, grouped in the Interface Configuration.	ransmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-	SSID capable). Per network settings like encryption or operation mode are
Device Configuration		
General Setup Advanced Settings		
Satur	Mode: Master   SSID: encore_will Channel: 00 (53:00 def) 10:00:00 Channel: 00 (53:00 def) 10:00/were 24 dbm 100% Signal: -53 dbm   Mode: -53 dbm Bitrate: 30:00 Mido   Country, In Country	
Wireless network is enabled	Disable	
Country Code	No Country	
Wireless Profile	802.11a+n	
Channel Spectrum Width	20/40 MHz	
Channel	Auto	
Obey Regulatory Power		
Antenna Gain (dBi)	0	
Transmit Power	Max	
Outdoor Channels		
Interface Configuration		
General Setup Wireless Security MAC-Filter Advanced Settings		
MAC-Address Filter	Disable 💌	
		🙆 Reset 🖉 Save 🙆 Save & Apply

17 The MAC Address Filter is disabled by default.

**Note:** If you wish to allow or block specific MAC addresses, **enable** the MAC address filter.

- **18** After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).
  - The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.
- **19** Under the heading **Interface Configuration**, select the **Advanced Settings** tab.

The Wireless Network Configuration Screen displays parameters for advanced configuration of the 802.11 wireless interface (Figure 6-10).

> Figure 6-10. Wireless Network Configuration Screen, Advanced Settings for Interface Configuration

ncore-networks Pevice Mode: Cell Failover Cell Signat: 12580m Operation Status: Online using WAN   Auto Refresh: on		Chang
Status System Network Logout Quickstart		
Interfaces Wifi Hostnames Static Routes Failover Firewall Diagnostics Q	QoS VPN VRRP DMNR	
Wireless Network: Master "encore wifi" (ath0)		
The Device Configuration section covers physical settings of the radio hardware such as chann grouped in the Interface Configuration.	nel, transmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation	on mode are
Device Configuration		
General Setup Advanced Settings		
Status	Mode: Natari (SEDD. excern_n) <sup>(1)</sup> BSSD: 4470.1111.011.010.010 1110.011.011.010.010.010 1110.011.010.0110.01	
Wireless network is enabled	0 Disable	
Country Code	Na Country	
Wireless Profile	802.11a+n	
Channel Spectrum Width	20/40 MHz	
Channel	Auto	
Obey Regulatory Power		
Antenna Gain (dBi)	0	
Transmit Power	Max	
Outdoor Channels	8	
Interface Configuration		
General Setup Wireless Security MAC-Filter Advanced Settings		
RIS Inteshold	2246	
Station Isolation	Prevents station-to-station communication	
Maximum Stations	127	
Minimum Stations RSSI		
802.11n Only		
WMM	V 🚱 Provides Quality of Service features	
	Reset Save	Save & Apply

- 20 On that screen, set values for the following fields:
  - Leave the RTS Threshold field blank.
  - If you wish to isolate communication between stations, check the box for **Station Isolation**.
  - Set the Maximum [number of] Stations.
  - Set the Minimum [number of] Stations RSSI.
  - If the EN-2000 uses only version n of 802.11, check the box for 802.11n Only.
  - Check the box for **WMM** (Wireless Multi-Media, also known as Wireless Multimedia Extension, WME).
- **21** After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).
  - The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.
- 22 After you have completed configuration of all the sections for the 802.11 wireless port, select the **Save & Apply** button (in the lower right corner of the screen).
  - The 802.11 wireless card configuration is complete, and is implemented immediately.

## 6.3 Configuring the 802.11 Wireless Card's Operating Mode

After you have configured the settings in Section 6.2, *Configuring an 802.11 Wireless Card in the EN-2000*, beginning on page 3, you can configure the 802.11 wireless card to use one of the following operating modes:

• To operate as a wireless access point: See Section 6.3.1, *Configuring the EN-2000's 802.11 Wireless Card as a Wireless Access Point*, on page 12.

After you configure the 802.11 wireless card to operate as a wireless access point, you can choose whether to designate that access point as a WiFi hotspot: See Section 6.3.2, *Designating the EN-2000's 802.11 Wireless Access Point as a WiFi Hotspot*, on page 15.

• To operate as a wireless client: See Section 6.3.3, *Configuring the EN-2000's* 802.11 Wireless Card as a Wireless Client, on page 16.

Note: A single 802.11 wireless card can operate in only one mode at a time.

# 6.3.1 Configuring the EN-2000's 802.11 Wireless Card as a Wireless Access Point

To configure the 802.11 wireless card as a wireless access point, use the steps in the following procedures:

- Section 6.3.1.1, *Configuring the Wireless Access Point*, on page 12
- Section 6.3.1.2, *Connecting Wireless Clients to the Wireless Access Point*, on page 13

## 6.3.1.1 Configuring the Wireless Access Point

1 On the EN-2000 Management System, select the **Networks** tab; then select the **Wifi** tab.

The Overview Screen for Wireless Configuration is displayed (Figure 6-11).

This screen provides basic information about the card's wireless specifications; it displays the MAC ID and supported versions of 802.11 (in Figure 6-11, **802.11an**). If the wireless card has already been configured, the display also lists the card's mode and related specifications. Figure 6-11. Overview Screen for Wireless Configuration

	1	EN2000 LTE Router Phone Device Mode: Cell Failover	≘/MTN#: r					Changes: 0
encor	e-networks	Cell Signal: -125dBm Operation Status: Online	using WAN   Auto	Refresh: on				
	System Network							
Interfaces	s Wifi Hostnames	Static Routes Failover Fi	rewall Diagnostic	S QoS VPN VRRP DMN	IR			
Wireless	s Overview							
AP	AR9342 802.11an F Channel: 104 (5.520 GHz)	Radio     Bitrate: 300 Mbit/s					Spectrum	Add
	100% BSSID: 04:F0:21:1	2:B1:26   Encryption: None				🛛 Disa	able 🖉 Edit	
Associat	ted Stations							
	MAC-Address	Network	Signal	Signal/Chains	Noise	TX Rate	RX Rate	тх-ссо
			No i	nformation available				

### 6.3.1.2 Connecting Wireless Clients to the Wireless Access Point

This is a quick procedure for connecting wireless clients to the 802.11 wireless access point that you set up in *Configuring the Wireless Access Point*, on page 12.

1 Open the management system for a device that will use this wireless access point to reach the network. That device can be any mobile or static device with 802.11 wireless capability. Use that device's system to connect to the wireless access point.

**Note:** If that other device is an EN-2000 or an EN-4000, you can connect that device to this access point by doing the following on that device's management system:

- a Select the Network tab.
- **b** Then select the **Wifi** tab.
  - The Overview Screen for Wireless Configuration is displayed (Figure 6-12).



		N2000 LTE Router Phor Device Mode: Cell Failove	ne/MTN#: er					Chang
	etworks	peration Status: Online	e using WAN   Auto Re	efresh: on				
	System Network L							
Interface:	s <mark>Wifi</mark> Hostnames Sta	tic Routes Failover F	Firewall Diagnostics	QoS VPN VRRP DMN	R			
Vireles	s Overview							
АР	AR9342 802.11an Rad Channel: 104 (5.520 GHz)   B	lio Nitrate: 300 Mbit/s					Scan	🗋 Add
	SSID: encore_wifi   Me 100% BSSID: 04:F0:21:12:B	ode: Master 1:26   Encryption: None				Disa	ible 🛛 Edit	
ssociat	ted Stations							
	MAC-Address	Network	Signal	Signal/Chains	Noise	TX Rate	RX Rate	TX-CCQ

- c Then select the Scan Button.
  - ♦ A list displays 802.11 wireless networks within range.
- d In that list, find the access point's network and select Join Network.
  - That wireless client device connects to the access point. Now the wireless client can go through the access point to reach the wireless network.

**Note:** Figure 6-13 shows some 802.11 wireless devices connected to an EN-2000 access point.

Figure 6-13. EN-2000 as Wireless Access Point



- **2** To see a list of devices connected to the 802.11 access point, do the following:
  - a Log onto the EN-2000 that is the 802.11 wireless access point.
- **b** Select the **Network** tab, then the **Wifi** tab.
  - The Wireless Overview Screen, Including a List of Associated Stations is displayed (Figure 6-14).

**Note:** The first associated station listed in Figure 6-14 displays the IP address of an EN-4000 router that connected (in step 1) to this access point.

Figure 6-14. Wireless Overview Screen, Including a List of Associated Stations

		EN2000 LTE R	outer Phone/MTN#: Coll Epilovor						Changes
ncor	e-net	works Cell Signal: -1	25dBm tus: Online using WAN LA	uto Refresh: o					
Cashing									
	System	Network Logout Quic							
Interfac	es Wifi	Hostnames Static Routes F	ailover Firewall Diagn	ostics QoS	VPN VRRP	DMNR.			
Wirele	ss Overvie	w							
	AR9342	802.11an Radio						Construm 1	Add
- <b>L</b>	Channel: 1	04 (5.520 GHz)   Bitrate: 300 M	bit/s					Spectrum	Add
	SSI BSS	D: encore_wifi   Mode: Master	tion: None				🕲 Disabl	le 🗹 Edit	
	100% 000	in our statistics ( cheryp							
Associa	ated Static	ons							
1									1
-	SSID	MAC Address	IPv4 Address	Signal	Noisc	RX Rate		TX Rate	
	EN4KWIFI	58:94:6B:8E:1F:3C	192.168.1.160	-43 dBm	-95 dBm	130.0 Mbit/s, MCS 15, 20MHz		117.0 Mbit/s, MCS 14, 20	MH∠
<b>d</b>	EN4KWIFI	74:DE:28:31:8C:68	?	-44 dBm	-95 dBm	1.0 Mbit/s, MCS 0, 20MHz		65.0 Mbit/s, MCS 7, 20M	Hz
L									
							I STATE		

## 6.3.2 Designating the EN-2000's 802.11 Wireless Access Point as a WiFi Hotspot

A WiFi hotspot is an 802.11 wireless access point provided for public use. It requires adherence to terms and obligations of use, and it generally requires a password.

Figure	6-15.	Hotspot	General	Settings

	2000 Phone/MTN#: vice Mode: Cell Failover	Change
Status System Network Log		
Interfaces Wifi Hotspot Failover General Settings RADIUS Configuratio	Diagnostics Firewall OpenVPN DHCP and DNS VPN VRRP Serial DMNR EnCloud Advanc In Authentication User's Configuration Terms and Conditions	ied
Enable Hotspot		
Hotspot Mode	User Name + Password (Radius Require ) Select your desired mode of hotspot. The current setting will be changed accordingly.	
Login Page Title	Hotspot ③ Title shown on the Login Page	
Idle Timeout	300  Default idle timeout (max idle time) in second, unless otherwise set by RADIUS (default 0, meaning unlimited).	:s to
<u></u>		0 <b>A</b> h
	Weset V Save U Sa	ave & Apply

- 1 On the EN-2000 management screen, select the **Network** tab; then select **Hotspot**, **General Settings**.
- 2 Select the box to Enable Hotspot.
- 3 In the field for Hotspot Mode, select password (no radius).

The field allows you to set a password for entry to the hotspot.

4 Select the button under that field, and set a password.

**Note:** General WiFi usually uses the password **encore#5** (for 5 GHz) or **encore#2** (for 2.4 GHz).

- 5 In the field Login Page Title, give the hotspot a name—for example, Encore Cafe.
- 6 Leave the Idle Timeout at 300.
- 7 Select the Save & Apply button (in the lower right corner of the screen).
  - The settings are saved. After customers log into WiFi, the next prompt will display the hotspot information.

# 6.3.3 Configuring the EN-2000's 802.11 Wireless Card as a Wireless Client

Figure 6-16 shows the EN-2000 as a wireless client.



To configure the wireless card as a client, you must first identify the wireless access point that the wireless card will connect to. That access point must support the type of 802.11 wireless transmission that the EN-2000 supports (802.11a, 802.11n, or combined support for 802.11a+n). You must also know the password (and other credentials, if applicable) to log on to that access point.

**Note:** Make sure you have already obtained the password and other log-in information for the selected network.

- 1 On the EN-2000 Management System, select the **Network** tab; then select the **Wifi** tab.
  - If the EN-2000 contains an 802.11 wireless card, the Overview Screen for Wireless Client Configuration is displayed (Figure 6-17).

Figure 6-17. Overview Screen for Wireless Configuration

		EN2000 LTE Router Ph Device Mode: Cell Failo	one/MTN#:					Changes	: 0
encor	e•networks	Cell Signal: -125dBm Operation Status: Onli	ne using WAN I Auto	Refresh: on					
11.010 ( <u>managar</u> an ang									
	System Network								
Interfac	es Wifi Hostnames	Static Routes Failover	Firewall Diagnostic	cs QoS VPN VRRP D	DMNR				
Wirele	ss Overview								
AP	AR9342 802.11an I Channel: 104 (5.520 GHz	Radio )   Bitrate: 300 Mbit/s					Spectrum	📋 Add	
	<b>SSID:</b> encore_wifi 100% <b>BSSID:</b> 04:F0:21:1	Mode: Master 12:B1:26   Encryption: Nor	ne			Ø Disal	ble 🛛 Edit		
Associa	ated Stations								
	MAC-Address	Network	Signal	Signal/Chains	Noise	TX Rate	RX Rate	TX-CCQ	
			No i	information available					

This screen provides basic information about the card's wireless specifications; it displays the MAC ID and supported versions of 802.11 (in Figure 6-17, 802.11an). If the wireless card has already been configured, the display also lists the card's mode and related specifications.

- 2 In the row for the 802.11 wireless card, select the Edit button.
  - The Wireless Network Configuration Screen is displayed (Figure 6-18).

	EN2000 LTE Router Phone/MTN#: Device Mode: Cell Failover Cell Signal: 12840		Changes: 0
enc	Operation Status: Online using WAN   Auto Refresh: on		
L	Status System Network Logout Quickstart		
	Interfaces <b>Wifi</b> Hostnames Static Routes Failover Firewall Diagnostics QoS VPN '	VRRP DMNR	
M	/ireless Network: Master "encore_wifi" (ath0)		
T) 91	te Device Configuration section covers physical settings of the radio hardware such as channel, transmit po ouped in the Interface Configuration.	ower or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode	are
	Device Configuration		
	General Setup Advanced Settings		
	Satus	Model Matter (SED) Andrea (Matter) Change (Setter) (SED) Andrea (Setter) Change (Setter) (Setter) (Setter) Signal: -35 den (Noise: -35 den Sitzer 200 Andrea (Country No Country	
	Wireless network is enabled	Disable	
	Country Code	No Country	
	Wireless Profile	802.11a+n	
	Channel Spectrum Width	20/40 MHz	
	Channel	Auto	
	Obey Regulatory Power		
	Antenna Gain (dBi)	0	
	Transmit Power	Max	
	Outdoor Channels		
	Interface Configuration		
	General Setup Wireless Security MAC-Filter Advanced Settings		
	Mode	Access Point	
	ESSID	encore_w/fi	
	Guard Interval	Short	
	Data Rate (Mbps)	Auto	
	Hide ESSID		
	Network		
		Van:	
		Choose the network you want to attach to this wireless interface.	
		Save Save	ve & Apply

Figure 6-18. Wireless Network Configuration Screen, General Setup for Interface Configuration

- 3 On the Wireless Network Configuration Screen, under the heading Interface Configuration (in the lower portion of the screen), make sure the General Setup tab is selected, and do the following:
  - a For the Mode, select Station.
- **b** Select the **Save & Apply** button.
  - The 802.11 card is established as a wireless client, and the screen is redisplayed.

**Note:** The upper portion of the screen now identifies the card as an 802.11 wireless client (Figure 6-19), but the configuration is not yet complete.

EN2000 LTE Router Phone/MTN#: Device Mode: Cell Failover Cell Signal: -125dBm Certexino, Stohic, Coline using WAN 1 Auto	Strate on	Change
Operation status: Online using waiv   Add		
Status System Network Logout Quickstart		
Interfaces Wifi Hostnames Static Routes Failover Firewall Di	Degrastica QoS VPN VRRP DHNR	
Wireless Network: Client "Encore" (ath0)		
The Device Configuration section covers physical settings of the radio hardware grouped in the Interface Configuration.	e such as channel, transmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode a	ine i
Device Configuration		
General Setup Advanced Settings		
Status	Media         Claring         SSIDD 6 Frequency           all         SSIDD 6 Frequency         Second SSID 5 Frequency           all         SSIDD 6 Frequency         Second SSID 5 Frequency           ***         Signat 32 dom   Noises - 35 dom         Signat.           Bitrates 30.00 M(k)   Country / Ke Country         Second SSID 5 Frequency	
Wireless network is enabled	Daable	
Country Code	No Country	
Wireless Profile	802.11a+n	
Channel Spectrum Width	20140 MHz 🗨	
Channel	44 (S 220 GHz)	
Obey Regulatory Power		
Antenna Gain (dBi)	0	
Transmit Power	Max 💌	
Outdoor Channels		
r Interface Configuration		
General Setun Wireless Security Advanced Settings		
Mode	Station	
ESSID	Encore	
BSSED	04.F0-21:12.B1-26	
Guard Interval	Short 🖉	
Data Rate (Mbps)	Auto	
Network	0 at #	
	<ul> <li>Ian: 表 ## 表</li> </ul>	
	want //	
	Choose the network you want to attach to this wireless interface.	
	@ Reset @ Save 3 Save	e & Apply
	Contract Contraction Contraction	· - · + Prij

Figure 6-19. Wireless Network Configuration Screen, EN-2000 as 802.11 Wireless Client

**Note:** The **Network** section, in the lower area of the screen, shows that the LAN port is still selected (detail in Figure 6-20).

Figure 6-20. Detail: LAN Port is Still Selected

Network	© 0 0	cell: 교 lan: 옷 20 옷 wan: 교
	0	Choose the network you want to attach to this wireless interface.

4 Select the WAN port as the 802.11 wireless client (detail in Figure 6-21).

Figure 6-21. Detail: Select the WAN Port

	Choose the network you want to attach to this wineless interface.
	💿 war: 🚑
	○ lan: 爱 楚 爱
Network	O cell: jj

5 Select the Save & Apply button (in the lower right corner of the screen).

The WAN port is now the 802.11 wireless client.

- 6 On the EN-2000 Management System, again select the **Network** tab; then select the **Wifi** tab.
  - The Overview Screen for Wireless Client Configuration is redisplayed (Figure 6-22). Now it has information for the 802.11 card as a wireless client.

Figure 6-22. Overview Screen for Wireless Client Configuration

Constrained and a second and a second and a second a sec
State     State     Grademannes     State     Grademannes     State       Mathewarks     Userskall     Calabranes     State     State       Mill     Hotschannes     State     State       Mill     Hotschannes     State     State       Mill     Hotschannes     State     State       Mill     State     State     State
Value         System         Metwork         Logod         Quedeatric           Interfaces         Wife         Interfaces         Participant         State           Wife         Interfaces         Participant         State         State           Wife         AR9342 802.11an Radio         Scan         Add           Image:         AR9342 802.11an Radio         Scan         Add           Image:         State         Image:         Image:         Edit           Image:         Image:         Image:         Image:         Image:         Image:           Associated Stations         Image:
Barteras Wili Perdoamus Static Routes Paneal Degrecifica QoS VPI 68.P DMM       Wireless Overview       Image: Scale Process Will Perdoamus Scale Context Permosition
Wireless Overview            •••••••••••••••••••••••••••••
AR9342 802.11an Radio Scan Add
AR3342 802.11an Radio Scan Add
Stop record, will Header Creet     Stop record, wild Header Creet     Stop record, wild Header Creet     Stop record
Associated Stations
Associated Stations
MAC-Address Network Signal Signal/Chains Noise TX Rate RX Rate TX-CCQ
No information available

**7** On the Overview Screen for Wireless Client Configuration, select the **Scan** button.

The screen lists available wireless networks (Figure 6-23).

Figure 6-23. Available Wireless Networks

encore-networks det cell server cell spatial 1288m cell spatial 1288m	Changes: (
Saha System Network Lopost Quidslant	
John Network: Wireless Scan	
Lectors TXX Grannel: 41 Mode: Matter   85501:04:70:21:12:81:261 [Encryption: coan	Join Network
	Back to overview Repeat scan

- 8 Select the Join Network button for the network you wish to join.
  - The selected network displays settings for connection to the network (Figure 6-24).

#### Figure 6-24. Log-In Screen for a Wireless Network

		PHODO UTE Roder Phone/MTM#: During Moder, 428 Future (MTM#)	Changes: 0
en	cor <mark>e-n</mark> etworks	cel Spral - 1258m Derrafors Skuts: Online une WAN	
	Status System Network		
	Join Network: Settings		
	L.c		
	ESSID	Encore	
	BSSID	04:F0:21:12:B1:26	
		Back to scan results S S	bmit

- **a** When you have reviewed the information, select the **Submit** button (in the lower right corner of the screen).
  - After your settings are implemented, the Wireless Network Client Configuration Screen is displayed (Figure 6-25).

Note: The screen heading identifies the 802.11 card as a wireless Client.

terfaces Wifi Hostnames Static Routes Failover Firewall	Asgnostics QoS VPN VRRP DMNR	
reless Network: Client "encore_wifi" (ath0)		
Device Configuration section covers physical settings of the radio hardwar uped in the Interface Configuration.	: such as channel, transmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per r	etwork settings like encryption or operation mode are
evice Configuration		
Seneral Setup Advanced Settings		
Status	SSID: encore_will   Mode: Client 100%, Wireless is disabled or not associated	
Wireless network is enabled	Oisable	
Country Code	No Country	
Vireless Profile	802.11a+n	
Channel Spectrum Width	20/40 MHz	
Thannel	44 (5.220 GHz)	
Dbey Regulatory Power		
Intenna Gain (dBi)	0	
fransmit Power	Max	
Dutdoor Channels		
nterface Configuration		
Inde	Station	
issid	Encore	
BSSID	04:F0:21:12:B1:26	
Guard Interval	Short	
Data Rate (Mbps)	Auto	
Network		
	Invating and     I	
	<ul> <li>Choose the network you want to attach to this wireless interface.</li> </ul>	

Figure 6-25. Wireless Network Client Configuration Screen

9 In the area for **Device Configuration** (in the upper portion of the screen), select **Advanced Settings**.

♦ The screen displays applicable fields (Figure 6-26).

Figure 6-26. Wireless Network Client Configuration Screen, Advanced Settings for Device Configuration

encoreinetworks	The: Unservel Changes g WAk   Ado Refrest: en
Status System Network Logout Quickstart	
Interfaces Wife Hostpames Static Routes Failover	
Wireless Network: Client "encore_wifi" (ath0)	
The Device Configuration section covers physical settings of the grouped in the Interface Configuration.	radio hardware such as channel, transmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encrystion or operation mode are
- Device Configuration	
General Setup Advanced Settings	
Distance Optimization (Auto-ACK Timeout)	Ev For Roint to Multi-Point customers, please disable this Auto-ACK Timeout and select the furthest distance of the cilent to this device. Or else, it would cause unstability
Distance (meters)	0 Mar 100 Mar 1000
Chainmant' Salartion	
- Interface Configuration	3
General Setup Wireless Security Advanced Settings	
Mode	Station
ESSID	Encore
BSSID	04:F0:21:12:B1:26
Guard Interval	Short
Data Rate (Mhor)	
	Auto
Network	
	In: 委然 金
	() [want 2]
	Cross the network you want to attach to this wireless interface.
	🕢 Reset 👷 Save 🔐 Save & Apply

- **10** Confer with your network administrator to determine the following:
  - a Whether to select the box for Distance Optimization.
  - **b** Whether to set the maximum **Distance** for transmission.
- 11 Confer with your network administrator to determine the **Chainmask** Selection for this site.
- 12 In the area for Interface Configuration (in the lower portion of the screen), select the Wireless Security tab.
  - The screen displays applicable fields (Figure 6-27).

Figure 6-27. Wireless Network Client Configuration Screen for Wireless Security

encoreinetworks		Unsaved Changes: 3
Status System Network Logout Quickstart		
Interfaces Wifi Hostnames Static Routes Failover Firewall Diagnostics QoS VPN VRRP D	MNR	
Wireless Network: Client "encore_wifi" (ath0)		
The Device Configuration section covers physical settings of the radio hardware such as channel, transmit power or ant grouped in the Interface Configuration.	enna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation	n mode are
Device Configuration		
General Setup Advanced Settings		
Distance Optimization (Auto-ACK Timeout)	🗐 🎱 For Point to Multi-Point customers, please disable this Auto-ACK Timeout and select the furthest distance of the client to this device. Or else, it would cause unstability	
Distance (meters)	₩ Mir: 300, Max: 24000	
Chainmask Selection	2x2	
Interface Configuration     General Setup     Wretess Security     Advanced Settings		
Encryption	No Encryption	
	Reset Save	🔝 Save & Apply

Note: By default, the EN-2000's 802.11 Encryption is set to no\_encryption.

- **13** On the Wireless Network Client Configuration Screen for Wireless Security, set the following values:
  - **a** Set the **Encryption** to match the encryption used by the network you are connecting to.

**Note:** When you select anything other than **no\_encryption**, additional fields are displayed (Figure 6-28).

Figure 6-28. Additional Fields to Support 802.11 Wireless Encryption

		EN2000 LTE Rou Device Mode: C	uter Phone/MTN#: `ell Failover			Unsaved Changes: 7
en	cor <mark>e-n</mark> etworks	Cell Signal: -12 Operation Statu	5dBm us: Online using WAN			
	Status System Network					
	Interfaces Wifi Hostnames					
w	/ireless Network: Master	"en2k2" (wifi0	.network2)			
TI	he <i>Device Configuration</i> section c etworks (if the radio hardware is r	overs physical setti multi-SSID capable).	ngs of the radio hardware such as channel, . Per network settings like encryption or ope	transmit power or antenna ration mode are grouped ir	selection which is shared amon the Interface Configuration.	g all defined wireless
	Interface Configuration					
	General Setup Wireless Secu	mac-Filter	Advanced Settings			
	Encryption		WPA2-PSK	•		
	Cipher		Auto	•		
	Кеу		2	2		
					🕲 Reset 🧲	Save 🔲 Save & Apply

- **b** Set the **Cipher** to match the cipher used by the network you are connecting to.
- **c** For the **Key** field, specify the password to gain access to the 802.11 wireless network access point. Get this password from your network administrator.
- **14** In the area for **Interface Configuration**, select the **Advanced Settings** tab.

The screen displays applicable fields (Figure 6-29).

Core-networks	urisar n
Status System <mark>Network</mark> Lagout Quickstart Interfaces <mark>Wifi</mark> Hostnames Static Routes Failover Firewall Diagnost	Qee VAN VARA DMNR
Wireless Network: Client "encore_wifi" (ath0)	
The Device Configuration section covers physical settings of the radio hardware such a grouped in the Interface Configuration.	annel, transmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode an
Device Configuration	
General Setup Advanced Settings	
Distance Optimization (Auto-ACK Timeout)	🔲 🥥 For Point to Multi-Point customers, please disable this Auto-ACK Timeout and select the furthest distance of the client to this device. Or else, it would cause unstability
Distance (meters)	↓ Hin: 300, Max: 2000
Chainmask Selection	2/2
Interface Configuration	
General Setup   Wireless Security   Advanced Settings	
RTS Threshold	2346
WMM	📝 🥥 Provides Quality of Service features
	Dent O Sun

Figure 6-29. Wireless Network Client Configuration Screen, Advanced Settings for Interface Configuration

- **15** Confer with your network administrator to determine settings to use.
- **16** In the area for **Device Configuration** (in the upper part of the screen), select **General Settings**.

### The screen displays applicable fields (Figure 6-30).

Figure 6-30. Wireless Network Client Configuration Screen, General Settings for Device Configuration

State         Enclose         Control           The Device Configuration         Image: State Stat	
Destination         With Restances         Calls Ranker	
Wireless Network: Client "encore_wiff" (ath0)           The Drive Configuration section over physical stillings of the ridbs hardware such as channel, brannet power or atterns selection which is shared among all defined wireless retworks (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs (if the ridb hardware is multi-SSID capable). For retwork settings like encryption or operation in physical ridbs. For retwork settings like encryption or operation in physical ridbs. For retwork settings like encryption or operation in physical ridbs. For retwork settings like encryption or operation in physical ridbs. For retwork settings like encryption or operation in physical ridbs.	
Project Configuration action stores physical bidlings of the radio backware such as abandi, breamil power or antenna solution which is aband among all defined which as aboveds (if the radio backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware such as abandi, breamil power or antenna solution which is aband among all defined which as aboved among solit afford which as multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable). Per reliverit solings like encryption or operation is provided in the backware is multi-SSID agable. Per reliverit solings like encryption or operation is provided in the backware is enclined in the backware is encryption. Per reliverit soli	
Device Configuration           General Seture           Status           Status           Status           Writes relaxed is enabled           Writes relaxed is enabled           Country Code           Notanni Seture           Writes relaxed is enabled           Country Code           Country Code           Channel Spectrum Writh           Channel Spectrum Three           Channel Spectrum Three           Channel Spectrum Three           Channel Spectrum Three           Channel Spectrum Three <tr< th=""><th>ode are</th></tr<>	ode are
General Setup     Setue       Satue     \$550 storm, will   Node Clent tree, Worksta is disabled or not associated       Windess notion(is enabled     © table       County Code     No County        Windess notion(is enabled)     © table       County Code     No County        Windess notion(is enabled)     © table       County Code     No County        Windess notion(is enabled)     © table       County Code     No County        Windess notion(is enabled)     © table       Charnel Section Witth     © Colore)       Tarsenk Prover     Max	
Bala     SBD: encry[Nedes Cleat to:       Wireless refunct, is enabled     Image: Cleat to:       Wireless refunct, is enabled     Image: Cleat to:       Country Code     Image: Cleat to:       Wireless Parlie     Image: Cleat to:       Channel Spectrum Width     2040 MHz       Channel Spectrum Width     2040 MHz       Channel Spectrum Width     44 (8.220 GHz)       Oler Aregulatory Power     Image: Cleat to:       Atterne Gan (db)     Image: Cleat to:       Transmit Power     Image: Cleat to:	
Wiretes network is stabled     © Dasabit       Country Code     No Country       Wiretess network     862. 11am       Wiretess network     862. 11am       Channel Spectrum Width     2040 MHz       Channel Spectrum Width     2040 MHz       Channel Spectrum Width     2040 MHz       Channel Spectrum Width     41 (5. 220 GHz)       Obey Regulatory Prover     —       Anterna Gain (db)     0       Transmit: Prover     —       Tarsmit: Prover     —	
Country Code     No Country       Winkss Profile     502.11am       Channel Spectrum Width     2040 MHz       C	
Windess Profile     802 11a+n       Channel Spectrum Width     20400 MHz       Channel     44 (5.220 GHz)       Channel     44 (5.220 GHz)       Channel Spectrum Spectrum     6       Transmit Prover     6       Transmit Prover     Max	
Charrel Spectrum Width 2040 MHz  Charrel Charr	
Channel     44 (3 220 GHz)       Obey Regulatory Power	
Obey Regulatory Power       Anterna Gain (dB)       Transmit Power       Max	
Anterna Gain (dB) 0 Transmit Power Max 💌	
Transmit Power Max	
Cudoor Channels	
Interface Configuration	
General Setup   Wireless Security   Advanced Settings	
RTS Threshold 2346	
WMM 🗹 🖉 📦 Provides Quarky of Service Natures	
Rest State	Save & Apply

Note: The Status display is only for information.

- **17** On the Wireless Network Client Configuration Screen, General Settings for Device Configuration, do the following:
  - **a** Make sure the parameter name reads **Wireless Network is Enabled**. (Do NOT select the option **Disable**, listed in the parameter field.)
  - **b** Select the **Country Code** to indicate the device's location.
  - c For the Wireless Profile, select the value 802.11 Wireless a+n.
  - d Set the Channel Spectrum Width.
  - e Set the Channel to Auto.
  - f Check Obey Regulatory Power.
  - g Set the Antenna Gain.
  - **h** Set **Transmit Power** to the highest value allowed in your region.
  - i Indicate whether to use Outdoor Channels.
  - j Select the Save & Apply button (in the lower right corner of the screen).
    - The EN-2000 is accepted as a wireless client, and the card's Wireless Overview screen is redisplayed, with updated information (Figure 6-31).



ore	networks	EN2000 CTE Reuter Phone/HTTGE Device Rode: Cell Failurer Cell Signal - 125dbm Dopration Status: Online using WAN 1 Au	te Refreste sin				e
Refer	Network	uget Questat					
otertees	W6 Notices	rs Static Routes Fairver Frenal	Diegrostice QuS VPN VRR	F DHNS			
lireless	Overview						
CPE .	AR9342 802.11an	Radio					Stan 🔝 Add
	SSED: encore	1   Model: Clerk et or net associated					a Erable 🔏 Edit
ssoci	ated Stations	6					
	SSID	HAC-Address	IPv4-Address	Signal	Noise	RX Rate	TX Rate
	PHCEP	FB:E4:FB:D0:27:3D	7	-42 dBm	-95 dBm	1.0 HbR/s, MCS 0, 20MHz	130.0 HbR/s, MCS 15, 20MHz

- **18** On the EN-2000 Management Screen, select the **Network** tab; then select the **Firewall** tab. If necessary, select the **General Settings** tab.
  - The interface's Firewall Zone Settings Screen is displayed (Figure 6-32).

EN2000 LTE Router Phone/MTN#: Device Mode: Cell Fallover Cell Signat: - 125dBm						
Operation Status: Online using WAN						
tatus System Network Logout Quickstart						
nterfaces Wifi Hostnames Static Routes Failover Firewall						
General Settings Port Forwards Traffic Rules						
rewall - Zone Settings						
e firewall creates zones over your network interfaces to control network to	affic flow.					
eneral Settings						
Enable SYN-flood protection						
Drop invalid packets						
· · · · · · · · · · · · · · · · · · ·						
		accept				
Output		accept				
Forward		reject	-			
0.000						
Zone - Forwardings	Input	Output	Forward	Masquerading	MSS clamping	
lan: lan: 🕸 💥 🐨 😑 wan cell	accept	accept	reject 🗨			🛃 Edit 🙁 Delete
want war: j + neser	reject	🖌 accept	reject 🛶	<b>V</b>	$\checkmark$	🔣 Edit 😠 Delete
cell: cell: 🔬 = nexer	reject	accept	reject 🖉	<b>V</b>	$\checkmark$	🔣 Edit 😠 Delete
Add						

Figure 6-32. Firewall Zone Settings Screen

**Note:** Firewall forwarding must be set up for each network that will be part of a failover set.

**19** In the area under **Zones**, select the **Edit** button in the row that starts with the label **LAN** (the first row in the **Zone Forwarding** list in Figure 6-32).

♦ The Firewall Zone Settings LAN Screen is displayed (Figure 6-33).

Figure 6-33. Firewall Zone Settings LAN Screen

ncore-networks				Changes
Statue System Network Langut Guideted				
Interfaces Wifi Hostnames Static Routes Failover Firewall Diagnostics				
General Settings Port Forwards Traffic Rules				
Firewall - Zone Setting - Zone "Jan"				
Zone "lae"				
This section defines common properties of "lan". The input and output options set the default policies for tre	fic entering and leaving this zone while the forward option descri	bes the policy for forwarded traffic between different ne	tworks within the zone. Covered networks specifies which available networks are member of	this zone.
General Settings Advanced Settings				
Name	lan			
Input	accept	Ţ		
Output	accept	<b>.</b>		
Forward	reject			
Masguerading				
MSS clamping				
Covered networks	avian1316: 10			
	wan:	_		
	create:			
- Inter-Zone Forwarding				
The options below control the forwarding policies between this zone (lan) and other zones. Destination zone to lan as well.	s cover forwarded traffic originating from "lan". Source zones	match forwarded traffic from other zones targeted at	t "lan". The forwarding rule is unidirectional, e.g. a forward from lan to wan does not imply a	permission to forward from wan
Allow forward to destination zones:	🗸 cell: cell: 🖉			
	🗹 wan: wan: 💒			
Allow forward from source zones:	celli cell: 🖉			
	wan: wan: 🔎			
Back to Overview			Reset	Save 🛛 Save & Apply

- 20 On that screen, make sure LAN is selected under Covered Networks, and make sure WAN and the new client network you created are selected under Allow Forward to Destination Zones.
- 21 On the Firewall Zone Settings LAN Screen, select Advanced Settings.

The applicable fields are displayed.

Figure 6-34. Firewall Zone Settings LAN Screen, Advanced Settings

EN2000 LTE Router Phone/MTN#: Device Mode: Cell Fallover Cell Signal: -1258Bm Cell Signal: -1258Bm		Change
Status System Network Lagout Quidkstart Interfaces Wifi Hostnames Static Routes Failover <mark>Firewall</mark> Diagnostics QoS		
General Settings Port Forwards Tatlic Rules      Firewall - Zone Settings - Zone "Lan"      Zone "Lan"      To settion afms common properties of "art." The input and output potions set the otheut policies for traffic end      This settion afms common properties of "art." The input and output potions set the otheut policies for traffic end	ring and taking this some withis the diversed option describes the policy for forwarded straffs between offenent networks within the some. Coversed networks as	cifies which available networks are member of this zone.
General Settings Restrict to address family	IPv4 only	
Restrict Masquerading to given source subnets	0.0.00	
Force connection tracking		
Enable logging on this zone		
Inter-Zone Forwarding     The options below control the towarding policies between this zone (lan) and other zones. Destination zones cover     to lan as well.	towarded traffic originating from "law". Source zones match towarded traffic from other zones targeted at "law". The towarding rule is unidirectional,	.g. a forward from lan to wan does not imply a permission to forward from wan
Allow forward to destination zones:	eetii cetti 🖉	
Allow forward from source source	V wan: van: 2	
	cette cotte and	

**22** You can use this screen if you wish to restrict masquerading for a specific source IP address or destination IP address.

**Note:** Figure 6-34 does not use any rules to restrict masquerading.

- 23 On the Firewall Zone Settings LAN Screen, select General Settings.
  - ✤ The applicable fields are displayed.

e-networks			
s System Network Logout Quickstart			
aces Wifi Hostnames Static Routes Failover Firéwall D			
eral Settings Port Forwards Traffic Rules			
vall - Zone Settings - Zone "lan"			
e "lan" ection defines common properties of "lan". The input and output options set the default	policies for traffic entering and leaving this zone while the forward option describ	es the policy for forwarded traffic between different netw	rorks within the zone. Covered networks specifies which available networks are member of this zone.
reral Settings Advanced Settings	•		
The second se	lan		
ut	accept		
put	accept		
ward	reject		
squerading			
5 clamping			
vered networks	avian3316: 🎬		
	V Ian: 👳 👥 👳		
	wan: 🏄		
	create:		
er-Zone Forwarding stions below control the forwarding policies between this zone (ian) and other zones. Du as well.	stination zones cover forwarded traffic originating from "lan". Source zones	match forwarded traffic from other zones targeted at "	ian". The forwarding rule is unidiractional, e.g. a forward from ian to wan does not imply a permission to forward
w forward to destination zones:	🗸 cell: cell: 🖉		
	wan: wan: 🧾		
v forward from source zones:			
	cell; cell; 🔬		
	wan: wan: 🔎		

Figure 6-35. Firewall Zone Settings LAN Screen, General Settings

- **24** Make sure **Masquerading** and **MSS Clamping** are selected for the networks to which you forwarded firewall settings in step 20 (in this example, **WAN** and the new client network).
- 25 Select the Save & Apply button.
  - The LAN's firewall rules are applied to the wireless WAN (the wireless card's wireless client interface).
- **26** On the EN-2000 Management Screen, again select the **Network** tab, then the **Interfaces** tab.
  - Interfaces on the EN-2000 are redisplayed, with updated information (Figure 6-36). This includes the client interface that you just configured.

	EN	2000 LTE Router Phone/MTN#:								Changes
enco	r <mark>e•n</mark> etworks	Il Signal: -125dBm eration Status: Online using WAN   Auto Refrest								
	tus System Network									
Int	erfaces Wifi Hostnames	Static Routes Failover Firewall Diagnos	stics QoS VPN VRRP DMNR							
Inte	rfaces									
IT In	terface Overview									
		Network	Status				ctions			
		AVLAN3316	Pressent The Rec core (Oracl) Tack core (Oracl)	2 Connec	: 0	Stop		Edit		Delete
		CELL A eftit	Updfmar (2010) MAC-Address (1959-51:58-51: PRESAG (1950) FX: 2019(6(77)-45.)	Connec	t 🥥	Stop		Edit		Delete
		LAN 近 (登然堂) brian	Update: 07: 01: 07: MACAddeese 07:01:10:12:128 Profession Static RC: 84:493 (98:Peta.) TX: 25: 75:63 (92:Peta.) TX: 25: 75:63 (92:Peta.)	Ø Connec	t 🥥	Stop		Edit		Delete
		WAN हों दले।	UpdBmic 79 h 126 MAX AddRess 00 h 20	Connec	t 🥥	Stop		Edit	×	Delete
	Add new interface									

Figure 6-36. Interfaces on the EN-2000

**Note:** It is possible for other devices on the EN-2000's wired LAN to use the EN-2000 Wireless Client's connection to reach the internet (Figure 6-37).



