

# WL1271 Command Line Interface (CLI) User's Guide



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## *Revision History*

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Version	Date	Description
1.0	November 2009	Release

## *Reference Documents*

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The documents listed below provide complementary specifications and information for the device:

- WL1271 and WL1273
- Windows Mobile Boot-up User Manual

## *About This Document*

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This guide describes the command line interface (CLI) that is used to configure the TI WLAN driver and to perform most WLAN operations.

The guide contains the following chapters:

- **Chapter 1, Introduction**, page 2
- **Chapter 2, Connection Menu**, page 2
- **Chapter 3, Management Menu**, page 2
- **Chapter 4, Privacy Menu**, page 2
- **Chapter 5, Scan Menu**, page 2
- **Chapter 6, QoS Menu**, page 2
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## ***Introduction***

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## 1.1 Overview

A TI Wireless Local Area Network (WLAN) user can control the driver and the FW by implementing applications using the API or using the configuration utility provided by TI. The Command Line Interface (CLI), described in this guide, can be used to configure the TI WLAN driver and to perform most WLAN operations, such as scanning, connecting and so on. It enables you to set different functional configurations (for roaming, scanning, security and power management) in the driver and the FW. It can also be used to perform TX, RX and calibration procedures, such as those used for the continuous transmission of packets and TX calibration. In addition, the user must be aware that in addition to the CLI and APIs that are used to configure the driver and firmware, during the driver initialization, hard-coded default parameters can be used. Furthermore, the **INI** file can override the default parameters.

## 1.2 How to Use the CLI

To access the CLI, refer to the *Getting Started Guide* for the specific OS. In Linux, for example, driver kernel object files are inserted first into the kernel. Then, the wlan\_loader is called, followed by the FW, then the wlan\_suppllicant and lastly the wlan\_cu (CLI) application.

```
insmod sdio.ko
insmod bmtrace.ko
insmod tiwlan_drv.ko
./tiwlan_loader
rm -f /var/run/tiwlan0
rm -f /tmp/*
```

Set the station (STA) IP address using an IP subnet that matches your AP, or use the **sdchp** utility to obtain the IP automatically from the router. For example, if the AP subnet is 192.168.1.x, you can use the following IP.

```
ifconfig tiwlan0 192.168.1.80 netmask 255.255.255.0 up
```

Then, call the Wi-Fi Protected Access (WPA) supplicant.

```
./wpa_suppllicant -Dwext -itiwlan0 -c wpa_suppllicant.txt &
sleep 1
```

Lastly, run the CLI.

```
./wlan_cu
```

After the CLI is running, the Root menu appears. In Figure 1 and throughout this document, characters in **blue** represent the output from the CLI and the kernel. Characters in **red** indicate what the user types. Characters in **black** show the CLI menu.

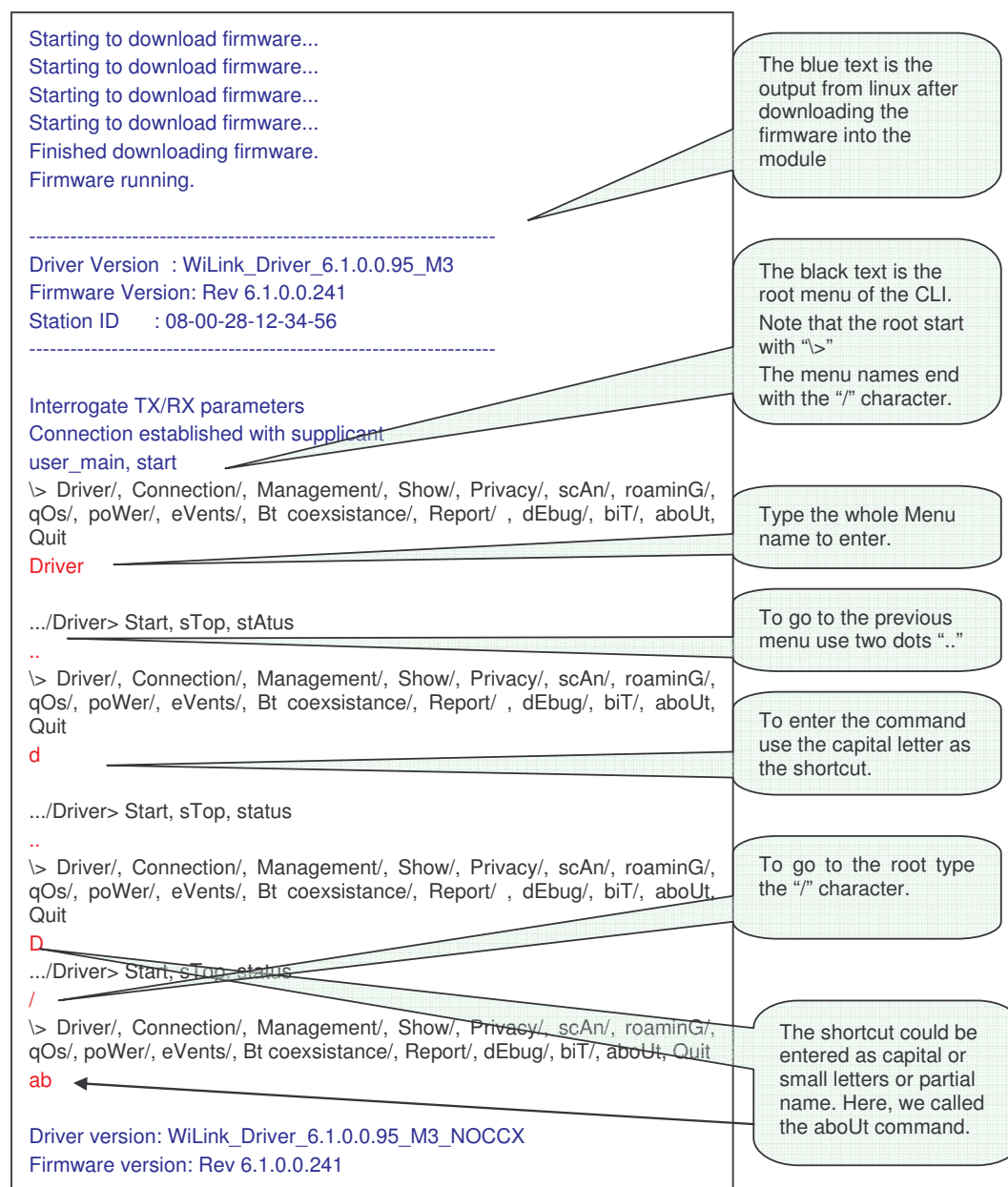


Figure 1: CLI Display

## 1.3 Using the Driver[d] Menu to Start and Stop the Driver

This menu is used to stop and start the driver. While the driver loads, the loader also downloads the FW. The driver configuration is preserved in the current session, even after stopping and restating the driver.

To change to the driver menu, type **d** from the root directory.

```
\>Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quitexsistance/, Report/, dEbug/, biT/, aboUt,
Quit
d
```

### 1.3.1 Start [s]

This command starts the driver operation after the stop command is executed.

```
.../Driver> Start, sTop, stAtus
s

SDIO clock Configuration is now set to 24Mhz
CHIP VERSION... set 1273 chip top registers
Working on a 1273 PG 2.0 board.
Starting to process NVS...
No Nvs, Setting default MAC address
pHwInit->uEEPROMCurLen: 1c
Chip ID is 0x4030111.
FEM Type 1
Starting to download firmware...
Starting to download firmware...
Starting to download firmware...
Starting to download firmware...
Starting to download firmware...
Starting to download firmware...
Finished downloading firmware.
Firmware running.

-----

Driver Version   : WiLink_Driver_6.1.0.0.84
Firmware Version: Rev 6.1.0.0.204
Station ID      : 08-00-28-12-34-56
-----

Interrogate TX/RX parameters
```

### 1.3.2 sTop [t]

This command blocks the driver API and turns off the TNET hardware (HW). The driver remains loaded and retains its configuration.

```
.../Driver> Start, sTop, stAtus
t

.../Driver> Start, sTop, stAtus
```

```
a
Driver is stopped!
```

When you start the driver, the FW is downloaded.

### 1.3.3 **status [a]**

This command prints the current status of the TI Host, including the driver status, TI Host MAC address, SSID, BSSID and channel.

```
.../Driver> Start, sTop, stAtus
```

```
a
```

```
=====
Status   : running
MAC      : 08.00.28.12.34.56
SSID     : net4guest
BSSID    : 00.15.2b.78.f1.91
Channel  : 1
=====
```

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## ***Connection Menu***

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Use the **Connection [c]** menu to connect/disconnect to/from an AP and see the found SSIDs.

The Connection menu provides commands for opening a new connection to a BSSID or an Independent Basic Service Set (IBSS). These commands are listed below.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
c
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
```

## 2.1 Bssid\_list [b]

This command displays a table with the TI Host BSSID list, including the following parameters:

- MAC address
- Privacy on/off
- RSSI level (dBm)
- Infrastructure (yes/no)
- Channel
- SSID

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
b
BssId List: Num=2
      MAC          Privacy    Rssi    Mode    Channel    SSID
00.15.2b.78.f1.90    1        -71    Infra     1        ****
00.23.69.37.c3.9f    0        -85    Infra    11        linksys
```

## 2.2 Connect [c]

This command enables a connection to a BSSID or IBSS. It is used in the following manner:

**Connect [<SSID> [<BSSID>]].** Both parameters are optional.

- Issuing the Connect command without specifying an SSID and or a BSSID attempts to connect to any available network.
- Issuing the command without a BSSID attempts to connect to any network with the specified SSID.
- Issuing the command with both parameters attempts to connect to a network with both the specified SSID and BSSID.

No connection is established until a network with the specified values is found.

**Example:** Connecting without any parameters

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
c
5
Trying to associate with SSID ''
OK
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
***** NEW CONNECTION *****
-- SSID = peterpan
```

```
-- BSSID = 0-f-b5-e6-ed-fc
*****
Associated with 00:0f:b5:e6:ed:fc
CTRL-EVENT-CONNECTED - Connection to 00:0f:b5:e6:ed:fc completed (reauth) [id=5 id_str=]
```

### Example: Connecting with an SSID parameter

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
b
BssId List: Num=4
      MAC          Privacy Rssi  Mode   Channel   SSID
00.15.2b.78.f1.90    1    -71  Infra     1      ****
00.15.2b.78.f1.91    0    -70  Infra     1      ****
*00.0f.b5.e6.ed.fc    0    -78  Infra     3      peterpan
00.23.69.37.c3.9f    0    -85  Infra    11      linksys

.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
c linksys

6
Trying to associate with SSID 'linksys'
OK
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
***** NEW CONNECTION *****
-- SSID  = linksys
-- BSSID = 0-23-69-37-c3-9f
*****
Associated with 00:23:69:37:c3:9f
CTRL-EVENT-CONNECTED - Connection to 00:23:69:37:c3:9f completed (reauth) [id=6 id_str=]
```

### Example: Connecting with both SSID and BSSID parameters

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
c peterpan 00:0f:b5:e6:ed:fc

7
Trying to associate with SSID 'peterpan'
OK
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
***** NEW CONNECTION *****
-- SSID  = peterpan
-- BSSID = 0-f-b5-e6-ed-fc
*****
Associated with 00:0f:b5:e6:ed:fc
CTRL-EVENT-CONNECTED - Connection to 00:0f:b5:e6:ed:fc completed (reauth) [id=7 id_str=]
```

## 2.3 Disassociate [d]

This command disassociates the connection from the current network. An attempt to disassociate when not connected results in a FAIL message. Otherwise, an OK message is displayed.

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
d
FAIL
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
d
OK
```

## 2.4 Status [s]

This command enables you to print the TI Host's current status, including the driver status, TI Host MAC address, SSID, BSSID and channel.

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
s

=====
Status      : running
MAC         : 08.00.28.12.34.56
SSID        : peterpan
BSSID       : 00.0f.b5.e6.ed.fc
Channel     : 3
=====
```

## 2.5 Full\_bssid\_list [f]

This command displays a table with the TI Host BSSID list, including the following enhanced information:

- Beacon interval, in milliseconds
- Capabilities

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
f

BssId List: Num=4

      MAC          Privacy Rssi  Mode   Channel   SSID
00.15.2b.78.f1.90    1    -71  Infra     1      ****
  BeaconInterval 100
  Capabilities  0x10
00.15.2b.78.f1.91    0    -70  Infra     1      ****
  BeaconInterval 100
  Capabilities  0x0
*00.0f.b5.e6.ed.fc    0    -78  Infra     3      peterpan
  BeaconInterval 100
  Capabilities  0x0
00.23.69.37.c3.9f    0    -85  Infra    11      linksys
  BeaconInterval 100
  Capabilities  0x0
```

## 2.6 Wi-Fi Protected Setup Submenu wPs [p]

To configure the Wi-Fi Protected Setup (WPS), use the commands described below.

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/  
p  
.../wPs> Pin, pBc, Stop, set pIn
```

### 2.6.1 Pin

The Pin command starts the authentication process.

```
.../wPs> Pin, pBc, Stop, set pIn  
p  
  
WPS in PIN mode started
```

### 2.6.2 Stop [s]

The WPS in PIN mode can be stopped using the Stop command.

```
.../wPs> Pin, pBc, Stop, set pIn  
s  
  
WPS mode stopped
```

### 2.6.3 set pin [i]

This command sets the PIN using the set PIN.

```
.../wPs> Pin, pBc, Stop, set pIn  
i 1234  
  
WPS PIN set 1234
```

### 2.6.4 pBc [b]

This command starts the Push Button Command (PBC) mode. It attempts to authenticate with the WPS AP during this process.

```
.../wPs> Pin, pBc, Stop, set pIn  
b  
  
WPS in PBC mode started
```

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## **Management Menu**

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3.7 preamble [e] .....	2
3.8 sLot [L] .....	2
3.9 rAdio on/off [A] .....	2
3.10 Info [i] .....	2
3.11 siGnal [g] .....	2
3.12 snr ratiO [o] .....	2
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3.14 tx_power_dBm_div10 [b] .....	2
3.15 tx_poWer_level [w] .....	2
3.16 802_11d_h [8] Submenu .....	2
3.17 beacon [n] Submenu .....	2
3.18 adVanced [v] .....	2
3.19 Statistics [s] .....	2
3.20 Txstatistics [t] .....	2
3.21 Advanced [a] .....	2
3.22 Power consumption [p] .....	2

Use the **Management [m]** menu to configure various Host parameters and Wi-Fi configurations.

The Management menu contains commands that supervise the TI Host parameters and Wi-Fi configurations.

From the Root, type **m** to enter this menu, as shown below:

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
m
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
```

### 3.1 connect moDe [d]

This command displays the current Connection mode, or sets the Connection mode to automatic or manual.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
d
Current mode = SME Auto
0 - SME Auto, 1 - SME Manual
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
d 1
current mode = SME Manual
0 - SME Auto, 1 - SME Manual
```

### 3.2 Channel [c]

This command shows the current channel or sets a channel for the IBSS.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
c
Channel=3 (desired: 11)
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
c 7
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
c
Channel=3 (desired: 7)
```

### 3.3 Rate [r]

This command shows the last data TX rate. If the station has not sent any data packets, it then shows Auto (0) as the rate.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

r
Rate: 54 Mbps
```

### 3.4 Mode [m]

This command selects the STA work mode, as follows:

- 0: Ad Hoc
- 1: Infrastructure
- 2: Auto mode

The default work mode is 1.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

m
Current mode = AD-Hoc
0 - AD-Hoc, 1 - Infr., 2 - Auto

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

m 2

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

m
Current mode = Infr.
0 - AD-Hoc, 1 - Infr., 2 - Auto
```

### 3.5 Frag [f]

This command displays the fragmentation threshold. If the command is entered with a value, it sets the STA fragmentation threshold (maximum = 4,096 bytes; minimum = 256 bytes). An example is shown below.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

f
Frag. threshold = 4096

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

f 2048

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

f
Frag. threshold = 2048
```



### 3.6 rTs [t]

This command displays or sets the STA Ready to Send (RTS) threshold (maximum = 4096). If the packet size is equal to or greater than the threshold, then the station sends an RTS frame before transmitting. The syntax of this command is **t <RTS\_threshold>**.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

t

RTS threshold = 4096

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

t 1000

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

t

RTS threshold = 1000
```

### 3.7 preamble [e]

This command selects a long or short preamble, as follows:

- 0: Long preamble
- 1: Short preamble

To see the current state of the preamble, enter **e**. To change the value, use this syntax: **e <preamble>**.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

e

Preamble = 1
0 - PREAMBLE_LONG, 1 - PREAMBLE_SHORT

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

e 0

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

e

Preamble = 0
0 - PREAMBLE_LONG, 1 - PREAMBLE_SHORT
```

### 3.8 sSlot [L]

This command selects a long or short slot time (the time difference between the packets), as follows:

- 0: Long slot time (20 ms)
- 1: Short slot time (9 ms)

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratiO, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

l

SlotTime = 1
0 - PHY_SLOT_TIME_LONG, 1 - PHY_SLOT_TIME_SHORT
```

### 3.9 rAdio on/off [A]

This command displays the Radio mode (ON/OFF) or sets the Radio mode, as follows:

- 0: Radio off
- 1: Radio on

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratiO, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

a

Radio state = ON
Turn radio on/off. 0=OFF, 1=ON
```

### 3.10 Info [i]

This command displays the selected BSSID information (SSID and BSSID). This command does not have any parameter. Type *i* to display the current values.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratiO, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

i

Selected BSSID Info:
-----
SSID : peterpan
BSSID : 00.0f.b5.e6.ed.fc
```

### 3.11 siGnal [g]

This command displays the current data and beacon RSSI level, in dBm.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratiO, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

g

Current dataRSSI=0 beaconRssi=-81
```

### 3.12 snr ratio [o]

This command displays the current SNR ratio, in dB.

```
.../Management> connect mode, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

o
Current dataSNR=0   beaconSnr=16
```

### 3.13 tX\_power\_table [x]

The TX power table displays the power level per sub-band, in dBm/10.

```
.../Management> connect mode, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

x
Power level table (Dbm/10)
sub-band 0: 0 0 0 0
sub-band 1: 0 0 0 0
sub-band 2: 0 0 0 26
sub-band 3: 250 2 22 253
sub-band 4: 7 7 9 10
sub-band 5: 12 15 19 20
sub-band 6: 24 28 33 38
sub-band 7: 44 49 57 66
```

### 3.14 tx\_power\_dBm\_div10 [b]

This command displays the current power level, in dBm. If no parameter is specified, then the function displays the configurable TX power in 1/10 dBm units. Otherwise, there is an option to specify the TX power level as an input parameter. In the following example, the command is first used without the input parameter. The TX power is then set to **205**.

```
.../Management> connect mode, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

b
Tx Power in DBM = 205
```

### 3.15 tx\_poWer\_level [w]

This command displays the current power level in dBm.

```
.../Management> connect mode, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

w
Tx Power level = -51
```

### 3.16 802\_11d\_h [8] Submenu

The 802\_11d\_h [8] submenu enables you to set and retrieve 802.11d and 802.11h capabilities, including regulatory domain zones and dynamic frequency selection.

```
.../Management> connect mode, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
8
.../802_11d_h> D_enabledisable, H_enabledisable, d_Country_2_4ie, d_cOuntry_5ie, dfS_range
```

#### 3.16.1 D\_enabledisable [d]

If entered without parameters, this command displays the 802.11d status. If entered with a 0 or 1, this command disables or enables the 802.11d regulatoryDomainEnabled capability.

The example below shows the command used without parameters. In this configuration, 802\_11d is disabled.

```
.../802_11d_h> D_enabledisable, H_enabledisable, d_Country_2_4ie, d_cOuntry_5ie, dfS_range
d
802_11d enabled = FALSE
```

To enable it, specify the following:

```
.../802_11d_h> D_enabledisable, H_enabledisable, d_Country_2_4ie, d_cOuntry_5ie, dfS_range
d 1
802_11d status is updated to = TRUE
```

To disable this feature, specify the following:

```
.../802_11d_h> D_enabledisable, H_enabledisable, d_Country_2_4ie, d_cOuntry_5ie, dfS_range
d 0
802_11d status is updated to = FALSE
```

#### 3.16.2 H\_enabledisable[h]

If this command is entered without parameters, it displays the 802.11h status. If it is entered with a 0 or 1, it disables or enables the 802.11h spectrumManagementEnabled capability.

To query the current status of this feature, specify the following:

```
.../802_11d_h> D_enabledisable, H_enabledisable, d_Country_2_4ie, d_cOuntry_5ie, dfS_range
h
802_11h enabled = FALSE
```

To enable 802.11h capabilities, specify the following:

```
.../802_11d_h> D_enabledisable, H_enabledisable, d_Country_2_4ie, d_cOuntry_5ie, dfS_range
h 1
802_11h enables automatically 802_11d!!
802_11h status is updated to =1
```

To disable this feature, specify the following:

```
.../802_11d_h> D_enabledisable, H_enabledisable, d_Country_2_4ie, d_cOuntry_5ie, dfS_range
h 0
802_11h status is updated to =0
```

### 3.16.3 **d\_Country\_2\_4ie [c]**

If entered without parameters, this instruction displays the 802.11d 2.4GHz Country name (if found). If entered with any parameter, it sets the 802.11d 2.4GHz GB Country IE. This setting is only allowed when no previous Country IE is found. This command is used when the station is in a disconnected state.

### 3.16.4 **d\_cOuntry\_5ie [o]**

If this command is entered without parameters, it displays the 802.11d 5GHz Country name (if found). If entered with any parameter, it sets the 802.11d 5GHz GB Country IE. This setting is only allowed when no previous Country IE is found. This command is used when the station is in disconnected state.

### 3.16.5 **dfS\_range [s]**

If this command is entered without parameters, it displays the DFS minimum and maximum channels. If entered with any parameter, it sets the DFS minimum and maximum channels

## 3.17 **beacon [n] Submenu**

This command provides instructions for setting the Beacon Filter mode.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratiO, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/

n

.../beacoN> Set beacon filter desired state, Get beacon filter current state
```

### 3.17.1 **Set beacon filter desired state [s]**

This command sets the Beacon Filter state, as follows:

- s 1: Sets the state to Active
- s 0: Sets the state to Inactive
- s: Displays all Beacon state options

```
.../beacoN> Set beacon filter desired state, Get beacon filter current state

s

0 - INACTIVE, 1 - ACTIVE
```

### 3.17.2 **Get beacon filter current state [g]**

This command retrieves the Beacon Filter's current state.

```
.../beacoN> Set beacon filter desired state, Get beacon filter current state

g

Desired State is FILTER ACTIVE
```

### 3.18 adVanced [v]

The adVanced submenu provides commands for testing the Management module.

```
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
v
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
```

#### 3.18.1 Supported rates [s]

This command displays and/or sets the transmission rates supported by the driver. There are four basic rates that must be supported: 1 Mbps, 2 Mbps, 5.5 Mbps and 11 Mbps.

- 1 Mbps (130 - basic)
- 2 Mbps (132 - basic)
- 5.5 Mbps (139 - basic)
- 11 Mbps (150 - basic)
- 22 Mbps (44)
- 6 Mbps (12)
- 9 Mbps (18)
- 12 Mbps (24)
- 18 Mbps (36)
- 24 Mbps (48)
- 36 Mbps (72)
- 48 Mbps (96)
- 54 Mbps (108)

Type **s** to display the currently supported rates.

```
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
s
Rates: 1 Mbps(130 - basic),2 Mbps(132 - basic),5.5 Mbps(139 - basic),11 Mbps(150 - basic),22
Mbps(44),6 Mbps(12),9 Mbps(18),12 Mbps(24),18 Mbps(36),24 Mbps(48),36 Mbps(72),48 Mbps(96),54
Mbps(108)
```

To select a subset of the rates, type the basic rates and the desired rates. For example, if only the basic rates are selected, type **s 130 132 139 150**. The driver works at 1, 2, 5.5 and 11 Mbps at basic rates. For basic rates, the driver does not support other rates.

```
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
s 130 132 139 150
param: 130 132 139 150
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
s
Rates: 1 Mbps(130 - basic),2 Mbps(132 - basic),5.5 Mbps(139 - basic),11 Mbps(150 - basic)
```

You can also set other, non-basic rates to be basic rates by calculating the corresponding basic number using the following formula:

**(The rate number – 1) \* 2 + 130 = basic number**

For example, to add the 18Mbps rate as a basic rate, the basic number is:

**(18 – 1) \* 2 + 130 = 164**

Then type **s 130 132 139 150 164 44 12 18 24 48 72 96 108**.

```
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
s 130 132 139 150 164 44 12 18 24 48 72 96 108
param: 130 132 139 150 164 44 12 18 24 48 72 96 108
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
s
Rates: 1 Mbps(130 - basic), 2 Mbps(132 - basic), 5.5 Mbps(139 - basic), 11 Mbps(150 - basic), 22
Mbps(44), 6 Mbps(12), 9 Mbps(18), 12 Mbps(24), 18 Mbps(164 - basic), 24 Mbps(48), 36 Mbps(72), 48
Mbps(96), 54 Mbps(108)
```

### 3.18.2 Health-check [h]

This command sends health check command to the FW.

```
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
h
Send health check..
```

### 3.18.3 rx data Filter [f] Submenu

The rx data Filter submenu provides commands for controlling the RX Data Filter.

```
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
f
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
```

#### 3.18.3.1 Enable [e]

This command enables the Rx Data Filter feature. No traffic reaches the host if filters are not added beforehand. Simply, type **e** to enable the filters.

```
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
e
Enabling Rx data filtering...
```

#### 3.18.3.2 Disable [d]

This command disables the Rx Data Filter feature.

```
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
d
Disabling Rx data filtering...
```

### 3.18.3.3 Add [a]

This command adds the specified filter. The filter mask should be provided in binary form and in an LSB-first format. The pattern should be provided in hexadecimal form. The filter in the example causes the FW to forward all packets whose first six bytes are **08 00 28 32 12 34**, meaning the destination MAC address is **08:00:28:32:12:34**.

```
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
a
Add Rx Data Filter: Add <Offset (0..255)>
<Mask (0..64 chars)>
<Pattern (0..128 chars)>
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
a 0 11111100 080028321234
Filter added.
```

### 3.18.3.4 Remove [r]

This command removes the specified filter. The parameters should be provided in the same manner as in the Add request. Note that the parameters must be identical to those supplied in the Add request.

```
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
r
Remove Rx Data Filter: Remove <Offset (0..255)>
<Mask (0..64 chars)>
<Pattern (0..128 chars)>
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
r 0 11111100 08002832

ERROR - IPC_STA_Private_Send - error sending Wext private IOCTL to STA driver (ioctl_cmd =
8000306, res = -1, errno = 95)
ERROR - CuCmd_AddRxDataFilter - Couldn't remove Rx data filter...
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
r 0 11111100 080028321234
Filter Removed.
```

### 3.18.3.5 Statistics [s]

Use this instruction to query the FW and display the filtering statistics.

```
.../rx data Filter> Enable, Disable, Add, Remove, Statistics
s
Rx data filtering statistics:
Unmatched packets: 14
Packets matching filter #1: 0
Packets matching filter #2: 0
Packets matching filter #3: 0
Packets matching filter #4: 0
```



### 3.18.4 Keep alive [k] Submenu

The Keep alive submenu provides commands for controlling the Power Manager Keep Alive setting.

```
.../adVanced> Supported rates, Health-check, rx data Filter/, Keep alive/
k
.../Keep alive> Enable, Disable, Add, Remove, Show
```

#### 3.18.4.1 Enable

Use this instruction to enable the Power Manager Keep Alive. Type **e** to enable the keep alive feature.

```
.../Keep alive> Enable, Disable, Add, Remove, Show
e
```

#### 3.18.4.2 Disable

This command disables the Power Manager Keep Alive.

```
.../Keep alive> Enable, Disable, Add, Remove, Show
d
```

#### 3.18.4.3 Add

Use this instruction to add a new Power Manager Keep Alive parameter.

```
.../Keep alive> Enable, Disable, Add, Remove, Show
a
Add a new keep-alive template: Add <Index (0..1)>
<Interval (msec) (0..1000000)>
<Trigger type (0-idle 1-always) (0..1)>
<Pattern (hex data) (0..128 chars)>
```

#### 3.18.4.4 Remove

Use this instruction to remove a Power Manager Keep Alive parameter.

```
.../Keep alive> Enable, Disable, Add, Remove, Show
r
Remove a keep-alive template: Remove <Index (0..1)>
```

#### 3.18.4.5 Show

Use this instruction to show the Power Manager Keep Alive current configuration.

```
.../Keep alive> Enable, Disable, Add, Remove, Show
s
Keep-Alive configuration:
-----
Keep-Alive global flag set to disabled

Index      Enabled  Trig Type Interval  Pattern
-----
0           0         N/A  0         N/A
1           0         0         N/A         0         N/A
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
```

```
S
.../Show> Statistics, Txstatistics, Advanced, Power consumption
```

### 3.19 Statistics [s]

This command shows the system details and statistics.

**Note:** This menu is subject to a change on the final product.

```
.../Show> Statistics, Txstatistics, Advanced, Power consumption
S

*****
Driver Statistics:
*****
    dot11CurrentTxRate : Auto (0)
        CurrentRxRate : 11 Mbps
    dot11DesiredChannel : 11
        currentMACAddress : 08.00.28.12.34.56
        dot11DesiredSSID : net4guest
        dot11BSSType : 1
    AuthenticationMode : 0
    bShortPreambleUsed : 1
        RTSThreshold : 4096
FragmentationThreshold : 4096
    bDefaultWEPKeyDefined : 0
        WEPStatus : 0
        TxPowerLevel : -51
        PowerMode : 0
        dataRssi : 193
        beaconRssi : 193
            RecvOk : 15371
            RecvError : 0
        DirectedBytesRecv : 1330
        DirectedFramesRecv : 86
        MulticastBytesRecv : 1014167
        MulticastFramesRecv : 14966
        BroadcastBytesRecv : 57549
        BroadcastFramesRecv : 319
            FcsErrors : 0
            BeaconsRecv : 77
        AssocRejects : 0
        AssocTimeouts : 0
        AuthRejects : 0
        AuthTimeouts : 0
```

## 3.20 Txstatistics [t]

This command displays transmission details and statistics.

```
.../Show> Statistics, Txstatistics, Advanced, Power consumption
t

*****
Tx Queues Statistics:
*****

Tx Queue 0:
=====
Total Good Frames           : 0
Unicast Bytes               : 0
Unicast Frames              : 0
Multicast Bytes             : 0
Multicast Frames            : 0
Broadcast Bytes             : 0
Broadcast Frames            : 0
Retry Failures              : 0
Tx Timeout Failures         : 0
No Link Failures            : 0
Other Failures              : 0
Max Consecutive Retry Failures : 0

Retry histogram:
-----
Retries:      0      1      2      3      4      5      6      7 packets:
0             0      0      0      0      0      0      0      0

Retries:      8      9     10     11     12     13     14     15 packets:
0             0      0      0      0      0      0      0      0

Total Delay ms (average/sum) : 0 / 0
FW Delay us (average/sum)   : 0 / 0
MAC Delay us (average/sum)   : 0 / 0

Delay Ranges [msec] : Num of packets
----- : -----
0 - 1 : 0
1 - 10 : 0
10 - 20 : 0
20 - 40 : 0
40 - 60 : 0
60 - 80 : 0
80 - 100 : 0
100 - 200 : 0
Above 200 : 0
```

## Tx Queue 1:

=====

```

Total Good Frames      : 0
Unicast Bytes          : 0
Unicast Frames         : 0
Multicast Bytes        : 0
Multicast Frames       : 0
Broadcast Bytes        : 0
Broadcast Frames       : 0
Retry Failures         : 0
Tx Timeout Failures    : 0
No Link Failures       : 0
Other Failures         : 0
Max Consecutive Retry Failures : 0

```

## Retry histogram:

-----

```

Retries:      0      1      2      3      4      5      6      7
packets:      0      0      0      0      0      0      0      0

Retries:      8      9     10     11     12     13     14     15
packets:      0      0      0      0      0      0      0      0

```

Total Delay ms (average/sum) : 0 / 0

FW Delay us (average/sum) : 0 / 0

MAC Delay us (average/sum) : 0 / 0

## Delay Ranges [msec] : Num of packets

----- : -----

```

0 - 1 : 0
1 - 10 : 0
10 - 20 : 0
20 - 40 : 0
40 - 60 : 0
60 - 80 : 0
80 - 100 : 0
100 - 200 : 0
Above 200 : 0

```

## Tx Queue 2:

=====

```

Total Good Frames      : 0
Unicast Bytes          : 0
Unicast Frames         : 0
Multicast Bytes        : 0
Multicast Frames       : 0
Broadcast Bytes        : 0

```

```

Broadcast Frames           : 0
Retry Failures             : 0
Tx Timeout Failures       : 0
No Link Failures          : 0
Other Failures             : 0
Max Consecutive Retry Failures : 0

```

Retry histogram:

-----

Retries:	0	1	2	3	4	5	6	7
packets:	0	0	0	0	0	0	0	0

Retries:	8	9	10	11	12	13	14	15
packets:	0	0	0	0	0	0	0	0

Total Delay ms (average/sum) : 0 / 0

FW Delay us (average/sum) : 0 / 0

MAC Delay us (average/sum) : 0 / 0

Delay Ranges [msec] : Num of packets

----- : -----

0 - 1	: 0
1 - 10	: 0
10 - 20	: 0
20 - 40	: 0
40 - 60	: 0
60 - 80	: 0
80 - 100	: 0
100 - 200	: 0
Above 200	: 0

Tx Queue 3:

=====

```

Total Good Frames           : 0
Unicast Bytes               : 0
Unicast Frames              : 0
Multicast Bytes             : 0
Multicast Frames            : 0
Broadcast Bytes             : 0
Broadcast Frames            : 0
Retry Failures              : 0
Tx Timeout Failures         : 0
No Link Failures            : 0
Other Failures              : 0
Max Consecutive Retry Failures : 0

```

Retry histogram:

-----								
Retries:	0	1	2	3	4	5	6	7
packets:	0	0	0	0	0	0	0	0
Retries:	8	9	10	11	12	13	14	15
packets:	0	0	0	0	0	0	0	0
Total Delay ms (average/sum) : 0 / 0								
FW Delay us (average/sum) : 0 / 0								
MAC Delay us (average/sum) : 0 / 0								
Delay Ranges [msec] : Num of packets								
----- : -----								
0	-	1	:	0				
1	-	10	:	0				
10	-	20	:	0				
20	-	40	:	0				
40	-	60	:	0				
60	-	80	:	0				
80	-	100	:	0				
100	-	200	:	0				
Above 200			:	0				

### 3.21 Advanced [a]

The Advanced command shows additional statistics.

```
.../Show> Statistics, Txstatistics, Advanced, Power consumption
a

*****
Advanced Statistics:
*****
Authentication : 0
Power mode : 0
Tx Power level : -51
Encryption Pairwise: 0
Encryption Group: 0
Preamble : <short>
Frag. threshold : 4096
RTS threshold : 4096
Power mode: 0 - AUTO, 1 - ACTIVE, 2 - SHORT_DOZE, 3 - LONG_DOZE
Encryption type: 0 - None, 1 - WEP, 2 - TKIP, 3 - AES
```

### 3.22 Power consumption [p]

With this command, the driver displays power consumption statistics.

```
.../Show> Statistics, Txstatistics, Advanced, Power consumption
```

P

```
Power Consumption Statistics:
```

```
-----
```

```
activeTimeCnt:0x0560310b
```

```
elpTimeCnt: 0x424e1fff9
```

```
powerDownTimeCnt: 0x02997a0a
```

```
ListenMode11BTimeCnt: 0x06150f42
```

```
ListenModeOFDMTimeCnt: 0x00
```

## Privacy Menu

---

---

---

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Use the **Privacy [p]** menu to configure different security configurations, such as WEP, WAP and WAP2. The **Privacy** menu contains commands to control and monitor the privacy configuration of the TI Host driver.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/ , dEbug/, biT/, aboUt, Quit

P

.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
```

## 4.1 Authentication [a]

This command enables you to set the Authentication mode. When no parameters are specified, this instruction displays the authentication options and the current mode.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/

a

0 - Open, 1 - Shared, 2 - AutoSwitch, 3 - WPA, 4 - WPAPSK, 5 - WPANone, 6 - WPA2, 7 - WPA2PSK
AuthenticationMode=0
```

## 4.2 Eap [e]

This command enables you to set the Extensible Authentication Protocol (EAP) to the following options:

**Table 1: EAP Parameters**

Parameter	Description
-1	OS_EAP_TYPE_NONE
4	OS_EAP_TYPE_MD5_CHALLENGE
6	OS_EAP_TYPE_GENERIC_TOKEN_CARD
13	OS_EAP_TYPE_TLS
17	OS_EAP_TYPE_LEAP
21	OS_EAP_TYPE_TTLS
25	OS_EAP_TYPE_PEAP
26	OS_EAP_TYPE_MS_CHAP_V2
43	OS_EAP_TYPE_FAST

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/

e

-1 - OS_EAP_TYPE_NONE, 4 - OS_EAP_TYPE_MD5_CHALLENGE, 6 - OS_EAP_TYPE_GENERIC_TOKEN_CARD, 13 -
OS_EAP_TYPE_TLS, 17 - OS_
EAP_TYPE_LEAP, 21 - OS_EAP_TYPE_TTLS, 25 - OS_EAP_TYPE_PEAP, 26 - OS_EAP_TYPE_MS_CHAP_V2, 43 -
OS_EAP_TYPE_FAST
```

### 4.3 encRyption [r]

This command displays the current encryption type used and enables you to set a different one.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/

r

0 - None, 1 - WEP, 2 - TKIP, 3 - AES

Encryption = 0
```

### 4.4 Keytype [k]

This command defines the security key type as static (0) or dynamic (1). To set the key type, enter **k <type>**. This parameter is used when 802.1x EAP authentication is used.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/

k

Set key type: Keytype <type>
```

### 4.5 Mixedmode [m]

This command enables you to enable or disable Mixed mode for WEP and None. Type **m 0** or **m 1** to enable or disable Mixed mode. When configured to WEP, Mixed mode enables the station to connect to an AP that is configured without security.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/

m

Mixed Mode: 0 - FALSE, 1 - TRUE

Mixed Mode =False
```

### 4.6 aNywpamode [n]

This command enables or disables Any WPA mode. To enable this mode type **n 1**, to disable it type **n 0**.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/

n

Any WPA Mode: 0 - FALSE, 1 - TRUE

Any WPA =False
```

### 4.7 Credentials [c]

This command sets the credentials (user name and password). To use this command, type **c <user name> <password>**.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/

c

Set Credentials : Credentials <User: (0..32 chars)>
[Password: (0..32 chars)]
```

## 4.8 pskPassphrase [p]

This command sets the password phrase for WPA-PSK encryption type. To set it, type **p <key>**.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, S
upPLICant/, Wep/

p

Set PSK Passphrase: pskPassphrase <Passphrase (8..64 chars)>
[key type (hex | text) [text]] (0..5 chars)
```

## 4.9 cerTificate [t]

This command is used to enable the use of WPA and WPA2 using EAP-TLS. The method of configuring the certificate differs depending on the platform, as follows:

- **TI HOST/ Linux:** To set the certificate file name, type **t <file\_name.cer> <validate>**.
- **Windows Mobile:** This feature is not configured through the CLI. It is configured by using a different method that is described in the *Windows Mobile Boot-up User Manual*.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, SupPLICant/, Wep/

t

Set Certificate: cerTificate <Certificate Name: (0..32 chars)>
[Validate (yes - 1 /no - 0):]
```

## 4.10 SupPLICant [s] Submenu

This submenu contains the commands for stopping and setting the debug levels.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, SupPLICant/, Wep/

s

.../SupPLICant> Kill, Debug
```

### 4.10.1 Kill [k]

This command stops the supplicant.

```
.../SupPLICant> Kill, Debug-

k

OK
```

### 4.10.2 Debug [d]

This command sets five different debug levels.

```
.../SupPLICant> Kill, Debug

d

Set debug: Debug <Level (0..4)>
<Show keys (0..1)>
<Show timestamps (yes - 1 /no - 0) (0..1)>
```

## 4.11 Wep [w] Submenu

This submenu sets and removes the WEP key configuration.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, S
upPLICant/, Wep/

w

.../Wep> Add, Remove, Get default key id
```

### 4.11.1 Add

This command is used to add a new WEP key and to indicate weather the key is the default one. This command should be used only in Static Key mode. Type **a** **<key>** **<key id>** **<default y/n>** **<key type hex/text>**. You must choose one key to be the default key.

```
.../Wep> Add, Remove, Get default key id

a

Add WEP: Add <Key Value (0..64 chars)>
<Tx Key Index>
<Default Key (yes - 1 /no - 0)>
[key type (hex | text) [hex] (0..5 chars)]
```

### 4.11.2 Remove

This command removes a WEP key. To use this command, type **r** **<key\_index>**.

```
.../Wep> Add, Remove, Get default key id

r

Remove WEP: Remove <Key Index>
```

### 4.11.3 Get default key id

This command displays the default WEP key.

```
.../Wep> Add, Remove, Get default key id

g

WEP default key ID = 0
```

*This page was intentionally left blank.*

## **Scan Menu**

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Use the **scAn menu [a]** to configure and run different scans types.

The Scan menu contains general configuration commands for the TI Host driver scan tools.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,  
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit  
  
a  
.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy/
```

## 5.1 Scan Values

Table 2 through Table 5 list the values that are used throughout the Scan menu.

**Table 2: Scan Types**

Value	Description
0	Normal passive scan
1	Normal active scan
2	Scheduled passive scan (SPS)
3	Triggered pasive scan
4	Triggered active scan
5	No scan

**Table 3: Early Termination**

Value	Description
0	Early termination disabled
16	Early termination on beacons only
32	Early termination on probe responses only
48	Early termination on both beacons and probe response (any frame)

**Table 4: Scan Rates**

Value	Description
0	Auto
1	1 Mbps
2	2 Mbps
4	5.5 Mbps
8	11 Mbps
16	22 Mbps
32	6 Mbps
64	9 Mbps
128	12 Mbps
256	18 Mbps
512	24 Mbps
1024	36 Mbps
2048	48 Mbps
4096	54 Mbps

Table 5: Scan Band

Value	Description
0	b / g (2.4 GHz)
1	A (5.0 GHz)

Table 6: AP Type

Value	Description
0	BSS independent
1	BSS infrastructure
2	BSS any

Table 7: Radio Band

Value	Description
0	2.4GHz radio band
1	5.0GHz radio band
2	Dual radio band

## 5.2 Start [s]

This command orders the driver to start the scan.

```
.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy/
s
Application scan started
```

## 5.3 sTop [t]

This command orders the driver to stop the scan.

```
.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy/
t
Application scan stopped
```

## 5.4 Wextstart [w]

This command takes one parameter or no parameters. The parameter may be a BSSID or SSID that is used as a filter in the scan. If no parameter is used, then the station scans for any SSID/BSSID.

In the following example, the Wextstart command is used without any parameters. The scan results are four SSIDs.

```
.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy/
w

.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy/
/ c b

\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
BssId List: Num=4
          MAC          Privacy Rssi Mode Channel SSID
```



```
00.15.2b.78.f1.90    1    -60  Infra    1    ****
00.15.2b.78.f1.91    0    -60  Infra    1    ****
00.0f.b5.e6.ed.fc    0    -85  Infra    3    peterpan
00.23.69.37.c3.9f    0    -80  Infra   11    linksys
```

In the next example, the scan is used with the Wextstart using an AP name as the parameter.

```
.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy
w net4guest

.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
b
BssId List: Num=1
          MAC          Privacy Rssi  Mode    Channel    SSID
00.15.2b.78.f1.91      0      -70  Infra     1    net4guest
```

## 5.5 configApp [a] Submenu

The configApp submenu contains commands for configuring the scan application.

```
.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy/
a
.../configApp> Global, Channel, cLear, Display
```

### 5.5.1 Global [g]

This command configures the scan application with the global parameters listed in Table 8.

**Table 8: Global Scan Parameters**

Parameter	Description
SSID	The SSID used for the scan (to which probe requests are sent and according to which results are filtered). Use <empty> for a broadcast scan.
Scan Type	The scan type to perform. See Table 2 for possible values.
Band	The band on which to perform the scan. See Table 5 for possible values.
Probe Request Number	The number of probe requests to send.
Probe Request Rate	The rate at which to send the probe requests. See Table 4 for possible values.
Number of Channels	The number of channels to scan. Each channel must be configured using the Channel command. See <i>Section 5.5.2, Channel [c]</i> for details.

```
.../configApp> Global, Channel, cLear, Display
g
Config Global Params: Global <SSID (0..33 chars)>
<Scan Type (0..4)>
<Band (0..1)>
<Probe Request Number (0..255)>
<Probe Request Rate (0..4096)>
<Tid (0..255)>
<Number of Channels (0..16)>
```

## 5.5.2 Channel [c]

This command configures the application scan with the per-channel parameters listed in Table 9.

**Table 9: Per-channel Parameters**

Parameter	Description
Index	The channel index in the command channel array.
BSSID	The BSSID to filter for on the channel. Use broadcast if no BSSID filtering is required. The format is xx:xx:xx:xx:xx:xx.
Max Dwell Time	The maximum dwell time, in microseconds.
Min Dwell Time	The minimum dwell time, in microseconds.
ET Condition	Early termination condition. See Table 3 for possible values.
ET Frame Number	The number of frames required for early termination.
TX power level	The power level at which to transmit probe requests, from 1 to 255. 1 is the weakest and 255 is the strongest.
Channel Number	The channel number to scan.

```

.../configApp> Global, Channel, cLear, Display
c
Config Channel Params: Channel <Index (0..30)>
<BSSID (xx:xx:xx:xx:xx:xx) (0..18 chars)>
<Max Dwell Time (0..100000000)>
<Min Dwell Time (0..100000000)>
<ET Condition (0..48)>
<ET Frame Number (0..255)>
<TX power level (0..255)>
<Channel Number (0..255)>

```

## 5.5.3 cLear [l]

This command clears the application scan parameters.

```

.../configApp> Global, Channel, cLear, Display
l
Application scan parameters cleared.

```

## 5.5.4 Display [d]

Use this command to display the current application scan parameters.

```

.../configApp> Global, Channel, cLear, Display
d

Application Scan params:
SSID: , Type: Active Normal Scan
Band: 2.4 GHz, Number of probe req:3, probe req. rate:Auto
Tid :0

Channel  BSS ID                Max time  Min time  ET event    ET frame num Power
-----

```

1	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
2	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
3	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
4	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
5	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
6	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
7	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
8	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
9	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
10	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
11	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
12	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
13	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205
14	ff.ff.ff.ff.ff.ff	60000	30000	ET disabled	0	205

## 5.6 configEriodic [e] Submenu

The configEriodic submenu contains the commands for configuring the Periodic Application Scan.

```
.../scAn> Start, sTop, Wextstart, configApp/, configEriodic/, configPolicy/
e

.../configEriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
```

### 5.6.1 Global [g]

This command configures the Periodic Application Scan parameters with user-defined global parameters, as defined in Table 10.

**Table 10: Global Periodic Application Scan Parameters**

Parameter	Description
RSSI threshold	Receive Signal Strength threshold (from -100dBm to 0 dBm)
SNR threshold	Signal to Noise ratio threshold (from -10 to 100 dB)
Report threshold	Report after N results are received
Terminate on report	Indicates whether to terminate after the report
BSS type	Scan BSS type
Probe request number	Number of probe requests to transmit per SSID
Number of scan cycles	Number of scan cycles to run
Number of SSIDs	Number of SSIDs scanned
Number of channels	Number of scanned channels

```
.../scAn> Start, sTop, Wextstart, configApp/, configEriodic/, configPolicy/
g
Configure global periodic scan parameter: Global <RSSI Threshold (-100..0)>
<SNR threshold (-10..100)>
<Report threshold (1..8)>
<Terminate on report (0..1)>
<BSS Type (0-independent, 1-infrastructure, 2-any) (0..2)>
```

```
<Probe request number! (0..5)>
<Number of scan cycles (0..100)>
<Number of SSIDs (0..8)>
<SSID List Filter Enabled (0..1)>
<Number of channels (0..32)>
```

### 5.6.2 **Interval [I]**

This command configures the table that holds intervals (in Msec) between two sequential scan cycles.

```
.../configEriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
i

Configure interval table: Interval <Index (0..15)>
<Interval (in millisec) (0..3600000)>
```

### 5.6.3 **Ssid [s]**

This command configures the SSID list.

```
.../configEriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
s

Configure SSID list: Ssid <Index (0..7)>
<Visibility (0-public, 1-hidden) (0..1)>
<SSID (0..33 chars)>
```

### 5.6.4 **Channel [c]**

This command configures the channels list.

```
.../configEriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
c

Configure channel list: Channel <Index (0..32)>
<Band (0-2.4GHz, 1-5GHz) (0..1)>
<Channel (0..180)>
<Scan Type (0-passive, 1-active) (0..1)>
<Min dwell time (in millisec)! (1..1000)>
<Max dwell time (in millisec)! (1..1000)>
<TX power level (dBm*10) (0..250)>
```

### 5.6.5 **cLear [l]**

This command clears the Periodic Scan Configuration.

```
.../configEriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
l

Periodic application scan parameters cleared.
```

### 5.6.6 Display [d]

This command displays the current Periodic Scan Configuration.

```
.../configPeriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
d

Application Periodic Scan parameters:
RSSI Threshold: -80, SNR Threshold: 0, Report Threshold: 1 Number of cycles: 0
Terminate on Report: True, BSS type: Any, Probe Request Number: 3

Intervals (msec):
3 30000 30000 30000 30000 30000 30000 30000 30000 30000 30000 30000 30000 30000 30000 30000

SSIDs:

SSID List Filter Enabled: 1

Channels:
Band          Channel  Scan type          Min dwell time  Max dwell time  Power level
(dBm*10)
-----
2.4 GHz       1         Active Normal Scan  5                20              205
2.4 GHz       2         Active Normal Scan  5                20              205
2.4 GHz       3         Active Normal Scan  5                20              205
2.4 GHz       4         Active Normal Scan  5                20              205
2.4 GHz       5         Active Normal Scan  5                20              205
2.4 GHz       6         Active Normal Scan  5                20              205
2.4 GHz       7         Active Normal Scan  5                20              205
2.4 GHz       8         Active Normal Scan  5                20              205
2.4 GHz       9         Active Normal Scan  5                20              205
2.4 GHz       10        Active Normal Scan  5                20              205
2.4 GHz       11        Active Normal Scan  5                20              205
2.4 GHz       12        Active Normal Scan  5                20              205
2.4 GHz       13        Active Normal Scan  5                20              205
2.4 GHz       14        Active Normal Scan  5                20              205
```

### 5.6.7 sTart [t]

This command starts the Periodic Application Scan.

```
.../configPeriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
t
Periodic application scan started
```

### 5.6.8 stoP [p]

This command stops the Periodic Application Scan.

```
.../configPeriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
p
Periodic application scan stopped.
```

## 5.7 configPolicy [p] Submenu

The configPolicy submenu contains the commands for configuring the scan manager policy (activated while roaming).

```
.../scAn> Start, sTop, Wextstart, configApp/, configpEriodic/, configPolicy/
p
.../configPolicy> Global, Band/, Display, cLear, Store, bsslistT
```

### 5.7.1 Global [g]

This command configures the scanning policy with the global policy parameters listed in Table 11.

**Table 11: Global Policy Parameters**

Parameter	Description
Normal scan interval	The interval, in milliseconds, at which to perform scan cycles, when the current AP quality is above the normal condition threshold. For more details about the normal condition threshold, you may refer to <i>Section 5.8, roaminG [g] Menu</i> .
Deteriorating scan interval	The interval, in milliseconds, at which to perform scan cycles, when current AP quality is below the normal condition threshold.
Max Track Failures	The maximum number of consecutive failures for a single AP before it is removed from the tracking list.
BSS list size	The maximum number of APs to track.
BSS Number to start discovery	The number of APs in the tracking list at or below which a discovery scan will be performed.
Number of bands	The number of bands for which the scan policy is defined, as follows: 0: Disables the background scan. 1: Scans one band. 2: Scans two bands.

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslistT
g
Set Global policy Params: Global <Normal scan interval (msec) (0..3600000)>
<Deteriorating scan interval (0..3600000)>
<Max Track Failures (0..20)>
<BSS list size (0..16)>
<BSS Number to start discovery (0..16)>
<Number of bands (0..2)>
```

### 5.7.2 Band [b] Submenu

The Band submenu contains the commands for configuring the scanning policy band parameters.

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslistT
b
.../Band> Misc, Channel, Track, Discovery, Immediate
```

### 5.7.2.1 Misc [m]

This command configures the miscellaneous band scanning policy with the band parameters summarized in Table 12.

**Table 12: Band Parameters**

Parameter	Description
Index	The band array index at which to store these band parameters.
Band	The band for which these parameters are configured. See Table 5 for possible values.
RSSI threshold	The minimum RSSI level below which incoming frames are discarded.
Channel number for discovery cycle	The maximum number of channels for each discovery scan.
Number of Channels	The total number of channels to scan on this band.

```
.../Band> Misc, Channel, Track, Discovery, Immediate
m
Set misc band params: Misc <Index (0..1)>
<Band (0..1)>
<RSSI threshold (-100..0)>
<Channel number for discovery cycle (0..30)>
<Number of Channels (0..30)>
```

### 5.7.2.2 Channel [c]

This command configures the channels to scan for each band. Table 13 lists the relevant parameters.

**Table 13: Channel Parameters**

Parameter	Description
Band Index	The band array index at which to store these band parameters
Channel Index	The channel array index at which to store this channel
Channel	The channel number

```
.../Band> Misc, Channel, Track, Discovery, Immediate
c
Set Channel params: Channel <Band Index (0..1)>
<Channel Index (0..29)>
<Channel (0..160)>
```

### 5.7.2.3 Track [t]

This command configures the tracking method for each band. Table 14 lists the tracking parameters.

**Table 14: Tracking Parameters**

Parameter	Description
Band Index	The band array index at which to store these band parameters.
Scan Type	The scan type to use for discovery scan. See <i>Section 5.1, Scan Values</i> for possible values.
ET event	The early termination event. See Table 3 for possible values.

Parameter	Description
ET num of frames	The number of frames required for early termination.
Triggering AC	The access category used for a triggered scan (if the scan type is triggered).
Scan Duration (SPS)	Scan duration, in microseconds, for an SPS scan (if the scan type is SPS).
Max dwell time	The maximum time, in microseconds, to stay on each channel (for non-SPS scans).
Min dwell time	The minimum time, in microseconds, to stay on each channel (for non-SPS scans).
Probe req. number	The number of probe request frames to send (if the type is active scan).
Probe req. rate	The rate at which to send the probe requests. See Table 4 for possible values.
TX power level	The power level at which to transmit probe requests, from 1 to 255. 1 is the weakest and 250 is the strongest.

```

.../Band> Misc, Channel, Track, Discovery, Immediate
t

Set tracking method params: Track <Band Index (0..1)>
<Scan Type (0..5)>
<ET event (0..48)>
<ET num of frames (0..255)>
<Triggering AC (0..255)>
<Scan Duration (SPS) (0..100000000)>
<Max dwell time (0..100000000)>
<Min dwell time (0..100000000)>
<Probe req. number (0..255)>
<Probe req. rate (0..4096)>
<TX power level (0..250)>

```

#### 5.7.2.4 Discovery [d]

This command configures the discovery method for each band. Table 15 lists the discovery parameters.

**Table 15: Discovery Parameters**

Parameter	Description
Band Index	The band array index at which to store these band parameters.
Scan Type	The scan type to use for discovery scan. See <i>Section 5.1, Scan Values</i> for possible values.
ET event	The early termination event. See Table 3 for possible values.
ET num of frames	The number of frames required for early termination.
Triggering AC	The access category used for a triggered scan (if the scan type is triggered).
Scan Duration (SPS)	Scan duration, in microseconds, for an SPS scan (if the scan type is SPS).
Max dwell time	The maximum time, in microseconds, to stay on each channel (for non-SPS scans).
Min dwell time	The minimum time, in microseconds, to stay on each channel (for non-SPS scans).
Probe req. number	The number of probe request frames to send (if the type is active scan).
Probe req. rate	The rate at which to send the probe requests. See Table 4 for possible values.
TX power level	The power level at which to transmit probe requests, from 1 to 255. 1 is the weakest and 250 is the strongest.



```

.../Band> Misc, Channel, Track, Discovery, Immediate
d

Set Discovery method params: Discovery <Band Index (0..1)>
<Scan Type (0..5)>
<ET event (0..48)>
<ET num of frames (0..255)>
<Triggering AC (0..255)>
<Scan Duration (SPS) (0..100000000)>
<Max dwell time (0..100000000)>
<Min dwell time (0..100000000)>
<Probe req. number (0..255)>
<Probe req. rate (0..4096)>
<TX power level (0..250)>

```

### 5.7.2.5 Immediate [i]

This command configures the immediate method for each band. The relevant immediate parameters are listed in Table 16.

**Table 16: Immediate Method Parameters**

Parameter	Description
Band Index	The band array index at which to store these band parameters.
Scan Type	The scan type to use for discovery scan. See <i>Section 5.1, Scan Values</i> for possible values.
ET event	The early termination event. See Table 3 for possible values.
ET num of frames	The number of frames required for early termination.
Triggering AC	The access category used for a triggered scan (if the scan type is triggered).
Scan Duration (SPS)	Scan duration, in microseconds, for an SPS scan (if the scan type is SPS).
Max dwell time	The maximum time, in microseconds, to stay on each channel (for non-SPS scans).
Min dwell time	The minimum time, in microseconds, to stay on each channel (for non-SPS scans).
Probe req. number	The number of probe request frames to send (if the type is active scan).
Probe req. rate	The rate at which to send the probe requests. See Table 4 for possible values.
TX power level	The power level at which to transmit probe requests, from 1 to 255. 1 is the weakest and 250 is the strongest.

```

.../Band> Misc, Channel, Track, Discovery, Immediate
i

Set Immediate method params: Immediate <Band Index (0..1)>
<Scan Type (0..5)>
<ET event (0..48)>
<ET num of frames (0..255)>
<Triggering AC (0..255)>
<Scan Duration (SPS) (0..100000000)>
<Max dwell time (0..100000000)>
<Min dwell time (0..100000000)>

```

```
<Probe req. number (0..255)>
<Probe req. rate (0..4096)>
<TX power level (0..250)>
```

### 5.7.3 **Display [d]**

This command displays the current scan policy parameters.

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslist
d

Scan Policy:
Normal scan interval: 10000, deteriorating scan interval: 5000
Max track attempt failures: 3
BSS list size: 4, number of BSSes to start discovery: 1
Number of configured bands: 1

Band: 2.4 GHz
RSSI Threshold: -80 dBm
Number of channels for each discovery interval: 3

Tracking Method:
Scan type: Active Normal Scan
Max channel dwell time: 30000, Min channel dwell time: 15000
ET condition: ET disabled , ET number of frames: 0
Probe request number: 3, probe request rate: Auto , TX level: 205

Discovery Method:
Scan type: Active Normal Scan
Max channel dwell time: 30000, Min channel dwell time: 15000
ET condition: ET disabled , ET number of frames: 0
Probe request number: 3, probe request rate: Auto , TX level: 205

Immediate Scan Method:
Scan type: Active Normal Scan
Max channel dwell time: 30000, Min channel dwell time: 15000
ET condition: ET disabled , ET number of frames: 0
Probe request number: 3, probe request rate: Auto , TX level: 205

Channel list:  1  2  3  4  5  6  7  8  9 10 11 12 13 14
```

### 5.7.4 **cLear [l]**

Use this command to clear the scanning policy parameters.

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslist
l
Scan policy cleared.
```

### 5.7.5 Store [s]

This command stores the scanning policy parameters on the driver.

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslisT
s

Scan policy stored.
```

### 5.7.6 bsslisT [t]A

This command displays the scan manager currently tracked APs list.

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslisT
t

BSS List:
BSSID           Band      Channel  RSSI  Neighbor?
-----
00.0f.b5.e6.ed.fc 2.4 GHz  3        -85    No
```

## 5.8 roaminG [g] Menu

The roaminG menu contains commands for using the roaming feature.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
g

.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
```

### 5.8.1 Enable

This command enables the roaming feature.

```
.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
e

Roaming is enabled
```

### 5.8.2 Disable

This command disables the roaming feature.

```
.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
d

Roaming is disabled
```

### 5.8.3 Low pass filter

This command sets the time, in seconds, to wait before low-quality roaming triggers. To use this command, type *l <seconds>*.

```
.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
l

Time in sec : Low pass filter <Low pass filter time` (0..1440)>

.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
l 5

Time in sec to wait before low quality Roaming Triggers,
lowPassFilterRoamingAttempt = 5 sec
```

### 5.8.4 Quality threshold [q]

This command sets the quality indicator (RSSI) to be used when comparing the AP list matching quality. To use this command, type *q <quality\_threshold>*.

```
.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
q

Quality indicator: Quality threshold <Quality threshold (-150..0)>

.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
q -80

Quality indicator (RSSI) to be used when comparing AP List matching quality,
apQualityThreshold = -80
```

### 5.8.5 Get [g]

This command retrieves all the currently configured roaming settings, including configuration and thresholds.

```
.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
g

Roaming is: Disabled

lowPassFilterRoamingAttempt = 30 sec,
apQualityThreshold = -70
Roaming Triggers' thresholds are:
dataRetryThreshold = 20,
lowQualityForBackgroundScanCondition = -80,
lowRssiThreshold = -80,
lowSnrThreshold = 0,
normalQualityForBackgroundScanCondition = -80,
numExpectedTbttForBSSLoss = 10,
txRateThreshold = 2
```

### 5.8.6 Thresholds [t] Submenu

The Thresholds submenu contains the respective commands for setting the following roaming thresholds:

- TX retry
- Gss loss
- TX rate threshold
- Low RSSI threshold
- Low SNR threshold
- Low quality for scan
- Normal quality for scan
- User-defined trigger

```
.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
t
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
```

### 5.8.7 Tx retry [t]

This command sets the number of consecutive data-retries threshold before the roaming trigger is invoked. To use this command, type **t** *<threshold\_value>*.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
t
Consecutive number of TX retries: Tx retry <Tx retry (0..255)>

.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
t 5
dataRetryThreshold = 5
```

### 5.8.8 Bss loss [b]

This command sets the number of expected Target Beacon Transmission Times (TBTTs), which is the time used by the AP to generate beacon frames, per BSS loss event. To use this command, type **b** *<expected\_TBTTs>*.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
b
Number of TBTTs: Bss loss <Bss loss (1..255)>

.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
b 10

Number of expected TBTTs for BSS Loss event,
numExpectedTbttForBSSLoss = 10
```

### 5.8.9 tx Rate threshold [r]

This command sets the TX rate threshold. To use it, type **r <threshold\_value>**.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
r
TX rate (fallback) threshold: tx Rate threshold <tx Rate threshold (0..54)>
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
r 20
txRateThreshold = 20
```

### 5.8.10 low rssi thresHold [h]

This command sets the low RSSI threshold. To use this command, type **h <threshold\_value>**.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
h
Low RSSI threshold: low rssi thresHold <Low rssi threshold (-150..0)>
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
h -80
lowRssiThreshold = -80
```

#### 5.8.10.1 low Snr threshold [s]

This command sets the low SNR threshold. To use this command, type **h <threshold\_value>**.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
s
Low SNR threshold: low Snr threshold <low Snr threshold (0..255)>
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
s 20
lowSnrThreshold = 20
```

### 5.8.11 low Quality for scan [q]

This command sets the threshold to increase the background scan period when the quality is low. To use it, type **q <threshold\_value>**.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
q
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
q -80
Indicator used to increase the background scan period when quality is low,
lowQualityForBackgroundScanCondition = -80
```

### 5.8.12 Normal quality for scan [n]

This command sets the threshold to reduce the background scan period when the quality is normal. To use it, type *n* **<threshold\_value>**.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
n
Reduce the background scan: Normal quality for scan <Normal quality for scan (-150..-40)>
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , 1
ow Quality for scan , Normal quality for scan , User defined trigger
n -70
Indicator used to reduce the background scan period when quality is normal,
normalQualityForBackgroundScanCondition = -70
```

### 5.8.13 User-defined trigger [u]

This command sets a user-defined trigger. To use it, type *u* **<threshold\_value>**.

```
.../Thresholds> Tx retry , Bss loss , tx Rate threshold , low rssi thresHold , low Snr
threshold , low Quality for scan , Normal quality for scan , User defined trigger
u
User defined FW trigger: User defined trigger
<Index (0..1)>
<Threshold [dB / dBm] (-100..100)>
<Pacing [Millisecond] (0..60000)>
<Metric [0 - bcon_rssi, 1 - pkt_rssi, 2 - bcon_snr, 3 - pkt_snr] (0..3)>
<Type [0 - Level, 1 - Edge] (0..1)>
<Direction [0 - Down, 1 - Up, 2 - Both] (0..2)>
<Hysteresis [dB] (0..255)>
<Enable [0 - Disable, 1 - Enable] ` (0..1)>
```

## **QoS Menu**

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Use the **qOs [o]** menu to configure various 802.11e features.

This menu contains commands for using Voice mode modules. If the access point supports the QoS features, it broadcasts it in its beacon or the probe response. When the station is connected to the AP, it checks the frames and the QoS capabilities. This menu checks whether or not the AP supports QoS, and if it does, displays the QoS parameters.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
o
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/
```

## 6.1 aP params [p]

This command displays the AC EDCA parameters (if connected) published by the AP (including the admission control flag per AC).

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/
p

AP QOS Parameters:
+-----+-----+-----+-----+-----+-----+
| AC | AdmCtrlFlag | AIFS | CwMin | CwMax | TXOPLimit |
+-----+-----+-----+-----+-----+-----+
| 0 | 0 | 3 | 15 | 1023 | 0 |
| 1 | 0 | 7 | 15 | 1023 | 0 |
| 2 | 0 | 2 | 7 | 15 | 3008 |
| 3 | 0 | 2 | 3 | 7 | 1504 |
+-----+-----+-----+-----+-----+-----+
```

If the station is not connect or the AP capabilities do not have QoS, the following results are received:

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/
p

ERROR - IPC_STA_Private_Send - error sending Wext private IOCTL to STA driver (ioctl_cmd =
801311,
res = -1, errno = 95)
```

## 6.2 ap Capabilities [c]

This command displays the AP capabilities, which include wireless mobile extensions (WME) and UPSD support. If the AP does not support either or these features, the flag is set to 0.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/
c

AP Qos Capabilities:
QOSFlag = 0
APSDFlag = 0
```

Below is an example of an AP that supports QoS. It shows an AP that supports QoS, but that does not support the automatic power saver delivery (APSD) mechanism.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

c
AP Qos Capabilities:
  QOSFlag = 1
  APSDFlag = 0
```

If the station is not connected, the following error message is received:

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx stre
Aming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

c
ERROR - IPC_STA_Private_Send - error sending Wext private IOCTL to STA driver (ioctl_cmd =
80062e,
res = -1, errno = 95)
```

### 6.3 ac Status [s]

This command retrieves the access category's (AC's) status (UPSD status and admission). To use this command, type *s <AC value>*.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

s
Get Current AC Status: ac Status <AC (0..3)>
```

### 6.4 dEsired ps mode [e]

This command retrieves the desired Power-Save (PS) mode per access category. There are four ACs:

- Best effort (BE)
- Video (VO)
- VoIP (VI)
- Background (BK)

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

e
Desired PS Mode (0=PS_POLL, 1=UPSD, 2=PS_NONE):
=====
+-----+-----+
|   AC   | Mode |
+-----+-----+
| General |   1   |
| BE_AC   |   0   |
| BK_AC   |   0   |
| VI_AC   |   0   |
| VO_AC   |   1   |
+-----+-----+
```

## 6.5 set ps rX streaming [x]

This command sets up to eight PS RX streams. Each stream can be configured to last from 10 ms to 100 ms, and with a TX timeout from 0 ms to 200 ms.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

x

Set PS Rx Streaming: set ps rX streaming <TID (0..7)>
<Stream Period (mSec) (10..100)>
<Tx Timeout (mSec) (0..200)>
<Enable (0..1)>
```

## 6.6 get ps rx streAming [a]

This command retrieves the PS RX streaming.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx stre
Aming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

a

PS Rx Streaming Parameters:
+-----+-----+-----+-----+
| TID | StreamPeriod | uTxTimeout | Enabled |
+-----+-----+-----+-----+
| 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 |
+-----+-----+-----+-----+
```

## 6.7 Qosparams [q]

This command configures the QoS parameters for each AC. MaxLifeTime is the maximum time allowed for transmitting an MSDU for each AC. Permitted values are 0 to 1024 time units (TUs), where one TU = 1024  $\mu$ s. The last parameter is the PS Delivery Protocol.

This command should be executed as q <acID> <MaxLifeTime> <PS Delivery Protocol>.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

q

Set QOS Parameters: Qosparams <acID (0..3)>
<MaxLifeTime (0..1024)>
[PS Delivery Protocol (0 - Legacy, 1 - U-APSD) (0..1)]
```

## 6.8 Rx timeout [r]

This command sets the time, in ms, to wait for RX packets after a trigger. The trigger may be a PS poll frame or UPSD-generated frame.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/
r
Rx TimeOut: Rx timeout <PsPoll (0..65000)>
<UPSD (0..65000)>
```

## 6.9 Insert class [i]

This command inserts a new classifier entry with the parameters described in Table 17. This insert command adds a class of type DSCP, port or IP + Port, with an optional parameter according to the type.

**Table 17: Insert Parameters**

Parameter	Description
Type	Classifier type: 1: DSCP 2: Port 3: IP + Port)
D-Tag	User priority to which to map the entry
Param1	DSCP / Port, which depends on the classifier type
Ip1, Ip2, Ip3, Ip4	[Optional] Four octets of IP addresses (when the classifier type is IP + Port)

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/
i
Insert new classification entry: Insert class <Type (1..3)>
<D-Tag (0..7)>
<Param1 (0..65535)>
[Ip1 (0..255)]
[Ip2 (0..255)]
[Ip3 (0..255)]
[Ip4 (0..255)]
```

## 6.10 remoVe class [v]

This command removes a classification entry. To delete a created class, use this command with the same parameters used to create it.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx stre Aming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/
v
Remove classification entry: remoVe class <Type (1..3)>
<D-Tag (0..7)>
<Param1 (0..65535)>
[Ip1 (0..255)]
```

```
[Ip2 (0..255)]
[Ip3 (0..255)]
[Ip4 (0..255)]
```

## 6.11 Tspec [t] Submenu

This submenu contains commands that request a traffic specification (TSPEC), which is used during admission control to request a specific AC stream to the AP.

```
.../qOs> aP params, ap Capabilities, ac Status, dEsired ps mode, set ps rX streaming, get ps
rx streAming, Qosparams, Rx timeout, Insert class, remoVe class, Tspec/

t

.../Tspec> Add, Get, Delete, Medium usage
```

### 6.11.1 Add [a]

This command requests that the driver send a TSPEC request for a specific user priority, along with the parameters listed in Table 18.

**Table 18: User Priority Parameters**

Parameter	Description
User Priority	User priority for sending the TSPEC request. Valid values are 0 (lowest) to 7 (highest).
NominalMSDUsize	Packet size, in bytes.
MeanDataRate	Data rate of the expected traffic (for example, voice = 166,400).
MinimumPHYRate	Minimum PHY rate for traffic.
SurplusBandwidthAllowance	Surplus bandwidth allowance.
UPSD Mode	Power-save delivery protocol (0 = Legacy Ps – Poll / 1 = UPSD)
MinimumServiceInterval	Minimum time in, microseconds (0 to 10 <sup>9</sup> us [1000s]).
MaximumServiceInterval	Maximum time, in microseconds (0 to 1000s).

There are eight user priorities, as shown below:

```
.../Tspec> Add, Get, Delete, Medium usage

a

Add TSPEC: Add <UserPriority (0..7)>
<NominalMSDUsize (1..2312)>
<MeanDataRate (Bps units) (0..54000000)>
<MinimumPHYRate (Mbps units) (0..54)>
<SurplusBandwidthAllowance (0..7)>
<UPSD Mode (0 - Legacy, 1 - U-APSD) (0..1)>
<MinimumServiceInterval (usec) (0..1000000000)>
<MaximumServiceInterval (usec) (0..1000000000)>
```

### 6.11.2 Get [g]

This command retrieves the current TSPEC parameters for the given user priority (only if admitted).

```
.../Tspec> Add, Get, Delete, Medium usage

g

Get TSPEC Params: Get <User priority (0..7)>
```

### 6.11.3 Delete [d]

This command sends a DEL\_TS (delete TSPEC) request to the AP for a given user priority (if admitted). It accepts the user priority and reason code to supply in the DEL\_TS frame.

```
.../Tspec> Add, Get, Delete, Medium usage
d

Delete TSPEC: Delete <UserPriority (0..7)>
<ReasonCode (32..45)>
```

### 6.11.4 Medium usage [m]

This command sets and retrieves the current medium usage threshold per AC (as a percentage of the AP credit given).

```
.../Tspec> Add, Get, Delete, Medium usage
m

Medium usage threshold: Medium usage <AC (0..3)>
[HighThreshold (0..100)]
[LowThreshold` (0..100)]
.../Tspec> Add, Get, Delete, Medium usage
m 1 99 76

Medium usage threshold for AC 1 has been set to:
LowThreshold = 76
HighThreshold = 99
```

*This page was intentionally left blank.*

## ***Power Menu***

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7.1 set_Power_mode.....	2
7.2 set_powersave_powerLevel.....	2
7.3 set_deFault_powerlevel.....	2
7.4 set_doZe_mode_in_auto .....	2
7.5 traffic_Thresholds.....	2
7.6 eNable .....	2
7.7 Disable .....	2



Use the **poWer [w]** menu to enable Sleep modes and set thresholds.

This menu contains the commands to configure the power save feature.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt co existence/, Report/, dEbug/, biT/, aboUt, Quit

w

.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto,traffic_Thresholds, eNable, Disable
```

## 7.1 set\_Power\_mode

Use this command to set the Power Management mode. There are four available modes:

- Active: The driver keeps the WL in active state continuously
- Short Doze: The WL wakes up on every beacon signal
- Long Doze: The WL wakes up on DTIM
- Auto: The driver uses an algorithm to decide which power profile is best

To use this command, type **p <Power mode value>**.

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable

p

Power mode: 0
0 - AUTO, 1 - ACTIVE, 2 - SHORT_DOZE, 3 - LONG_DOZE
```

## 7.2 set\_powersave\_powerLevel

Use this command to set the level of the power manager.

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto,traffic_Thresholds, eNable, Disable

l

Power Level PowerSave is: Extreme Low Power
0 - Extreme Low Power, 1 - Power Down, 2 - Awake
```

## 7.3 set\_deFault\_powerlevel

This command displays the default power level without parameters. If entered with a parameter, it sets the default level.

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto,traffic_Thresholds, eNable, Disable

f

Power Level Default is: Extreme Low Power
0 - Extreme Low Power, 1 - Power Down, 2 - Awake
```

## 7.4 set\_doZe\_mode\_in\_auto

This command displays the current Doze mode for the Auto Power mode without parameters. If entered with a parameter, it sets the Doze mode (Short or Doze) for the Auto Power mode.

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,  
set_doZe_mode_in_auto,traffic_Thresholds, eNable, Disable
```

z

```
Doze power level in auto mode is: SHORT_DOZE
```

## 7.5 traffic\_Thresholds

This command sets the traffic thresholds.

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,  
set_doZe_mode_in_auto,traffic_Thresholds, eNable, Disable
```

t

```
Traffic intensity thresholds :
```

```
HighThreshold = 100
```

```
LowThreshold = 25
```

```
TestInterval = 1000
```

## 7.6 eNable

This command enables traffic intensity thresholds.

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,  
set_doZe_mode_in_auto,traffic_Thresholds, eNable, Disable
```

n

```
Traffic intensity thresholds enabled...
```

## 7.7 Disable

Use this command to disable traffic intensity thresholds.

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,  
set_doZe_mode_in_auto,traffic_Thresholds, eNable, Disable
```

d

```
Traffic intensity thresholds disabled...
```

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## ***Events Menu***

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Topic	Page
8.1 Register [r].....	2
8.2 Unregister [u].....	2

Use the **eVents [v]** menu to program the FW to send events to the application.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit

v

.../eVents> Register, Unregister
```

## 8.1 Register [r]

This command registers a specific event.

```
.../eVents> Register, Unregister

r

0 - Associated
1 - Disassociated
2 - LinkSpeed
3 - Authentication Success
5 - ScanComplete
6 - ScanStopped
8 - Media_Specific
9 - EAPOL
10 - Bound
11 - Unbound
12 - PreAuth EAPOL
14 - Low RSSI
15 - IPC_EVENT_TSPEC_STATUS
16 - IPC_EVENT_TSPEC_RATE_STATUS
17 - IPC_EVENT_MEDIUM_TIME_CROSS
18 - ROAMING_COMPLETE
19 - EAP-FAST/LEAP Auth Failed
20 - IPC_EVENT_WPA2_PREAUTHENTICATION
21 - IPC_EVENT_TRAFFIC_INTENSITY_THRESHOLD_CROSSED
22 - ScanFailed
23 - IPC_EVENT_WPS_SESSION_OVERLAP
24 - IPC_EVENT_RSSI_SNR_TRIGGER_0
25 - IPC_EVENT_RSSI_SNR_TRIGGER_1

35 - IPC_EVENT_RE_AUTH_STARTED
36 - IPC_EVENT_RE_AUTH_COMPLETED
37 - IPC_EVENT_RE_AUTH_TERMINATED
38 - Timeout
```

After enabling an event again, you receive a warning.

```
.../eVents> Register, Unregister

r 5

.../eVents> Register, Unregister

r 5

CuCmd_RegisterEvents, event ScanComplete is already enabled!
```

## 8.2 Unregister [u]

This command unregisters an event.

```
.../eVents> Register, Unregister
u
0 - Associated
1 - Disassociated
2 - LinkSpeed
3 - Authentication Success
5 - ScanComplete
6 - ScanStopped
8 - Media_Specific
9 - EAPOL
10 - Bound
11 - Unbound
12 - PreAuth EAPOL
14 - Low RSSI
15 - IPC_EVENT_TSPEC_STATUS
16 - IPC_EVENT_TSPEC_RATE_STATUS
17 - IPC_EVENT_MEDIUM_TIME_CROSS
18 - ROAMING_COMPLETE
19 - EAP-FAST/LEAP Auth Failed
20 - IPC_EVENT_WPA2_PREAUTHENTICATION
21- IPC_EVENT_TRAFFIC_INTENSITY_THRESHOLD_CROSSED
22 - ScanFailed
23 - IPC_EVENT_WPS_SESSION_OVERLAP
24 - IPC_EVENT_RSSI_SNR_TRIGGER_0
25 - IPC_EVENT_RSSI_SNR_TRIGGER_1
35 - IPC_EVENT_RE_AUTH_STARTED
36 - IPC_EVENT_RE_AUTH_C OMPLETED
37 - IPC_EVENT_RE_AUTH_TERMINATED
38 - Timeout
```

To unregister an event, type the commands and the register. If the event is already unregistered, a warning is displayed, as shown below:

```
.../eVents> Register, Unregister
u 5
.../eVents> Register, Unregister
u 5
CuCmd_RegisterEvents, event ScanComplete is already disabled!
```

*This page was intentionally left blank.*

## ***Bt Coexistence Menu***

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Topic	Page
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9.2 Config [c] .....	2
9.3 Status [s] .....	2
9.4 coexActivity [a] .....	2
9.5 Fm_coexistence [f] .....	2



Use the **Bt coexistence [b]** menu to enable the various BT-WLAN and FM-WLAN Coexistence modes.

This menu contains commands to set BT coexistence capabilities.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
b
.../Bt coexistence> Enable, Config, Status, coexActivity, Fm_coexistence
```

## 9.1 Enable [e]

Use this command to enable/disable BT coexistence.

```
.../Bt coexistence> Enable, Config, Status, coexActivity, Fm_coexistence
e
0 - Disable, 1 - Protective, 2 - Opportunistic
```

## 9.2 Config [c]

This command enables you to configure all Soft Gemini parameters. Typing the command without parameters displays all the parameters and the permitted ranges.

```
.../Bt coexistence> Enable, Config, Status, coexActivity, Fm_coexistence
c

Please enter <index (0,1..)> <value>
Param 0 - coexBtPerThreshold (0 - 10000000) PER threshold in PPM of the BT voice
Param 1 - coexAutoScanCompensationMaxTime (0 - 10000000 usec)
Param 2 - coexBtNfsSampleInterval (1 - 65000 msec)
Param 3 - coexBtLoadRatio (0 - 100 %)
Param 4 - coexAutoPsMode (0 = Disabled, 1 = Enabled) Auto Power Save
Param 5 - coexAutoScanEnlargedNumOfProbeReqPercent (%)
Param 6 - coexAutoScanEnlargedScanWindowPercent (%)
Param 7 - coexAntennaConfiguration (0 = Single, 1 = Dual)
Param 8 - coexMaxConsecutiveBeaconMissPrecent (1 - 100 %)
Param 9 - coexAPRateAdapationThr - rates (1 - 54)
Param 10 - coexAPRateAdapationSnr (-128 - 127)
Param 11 - coexWlanPsBtAclMinBR (usec)
Param 12 - coexWlanPsBtAclMaxBR (usec)
Param 13 - coexbtAclWlanPsMaxBR (usec)
Param 14 - coexWlanPsBtAclMinEDR (usec)
Param 15 - coexWlanPsBtAclMaxEDR (usec)
Param 16 - coexbtAclWlanPsMaxEDR (usec)
Param 17 - coexRxt (usec)
Param 18 - coexTxt (usec)
Param 19 - coexAdaptiveRxtTxt (0 = Disable, 1 = Enable)
Param 20 - coexPsPollTimeout (msec)
Param 21 - coexUpsdTimeout (msec)
Param 22 - coexBtAclWlanActiveBtMax (usec)
Param 23 - coexBtAclWlanActiveWlanMax (usec)
```

```
Param 24 - Temp param 1
Param 25 - Temp param 2
Param 26 - Temp param 3
Param 27 - Temp param 4
Param 28 - Temp param 5
```

### 9.3 Status [s]

This command displays the values of all the parameters.

```
.../Bt coexistence> Enable, Config, Status, coexActivity, Fm_coexistence
S

[0]: coexBtPerThreshold = 7500
[1]: coexAutoScanCompensationMaxTime = 120000 (usec)
[2]: coexBtNfsSampleInterval = 400 (msec)
[3]: coexBtLoadRatio = 50 (%)
[4]: coexAutoPsMode = Enabled
[5]: coexAutoScanEnlargedNumOfProbeReqPercent = 170 (%)
[6]: coexAutoScanEnlargedScanWindowPercent = 50 (%)
[7]: coexAntennaConfiguration = Single (0 = Single, 1 = Dual)
[8]: coexMaxConsecutiveBeaconMissPrecent = 60 (%)
[9]: coexAPRateAdapationThr = 12
[10]: coexAPRateAdapationSnr = 0
[11]: coexWlanPsBtAclMinBR = 10000 (usec)
[12]: coexWlanPsBtAclMaxBR = 40000 (usec)
[13]: coexbtAclWlanPsMaxBR = 8000 (usec)
[14]: coexWlanPsBtAclMinEDR = 8000 (usec)
[15]: coexWlanPsBtAclMaxEDR = 25000 (usec)
[16]: coexbtAclWlanPsMaxEDR = 20000 (usec)
[17]: coexRxt = 1200 (usec)
[18]: coexTxt = 1000 (usec)
[19]: coexAdaptiveRxtTxt = Disabled
[20]: coexPsPollTimeout = 10 (msec)
[21]: coexUpsdTimeout = 10 (msec)
[22]: coexBtAclWlanActiveBtMax = 10000 (usec)
[23]: coexBtAclWlanActiveWlanMax = 15000 (usec)
Enable mode : SG_PROTECTIVE
Driver Enabled : NO
Protective mode : OFF
PsPoll failure active : NO
```

## 9.4 coexActivity [a]

This command sets the coexistence activity parameters. To display the parameter names and ranges, type **a**. To set them, type **a <coexIp> <activityId> <defaultPriority> <raisedPriority> <minService> <maxService>**.

```
.../Bt coexistence> Enable, Config, Status, coexActivity, Fm_coexistence
a
Param 1 - coexIp          (0 - 1) BT-0, WLAN-1
Param 2 - activityId      (0 - 24)
Param 3 - defaultPriority (0 - 255)
Param 4 - raisedPriority  (0 - 255)
Param 5 - minService      (0 - 65535)
Param 6 - maxService      (0 - 65535)
```

## 9.5 Fm\_coexistence [f]

This command configures the FM-WLAN coexistence parameters. To display all the parameter names and their permitted ranges, type **f**. To set the FM coexistence, enter a value for all ten parameters:

**f <p1> <p2> <p3> <p3> <p4> <p5> <p6> <p7> <p8> <p9> <p10>**

```
.../Bt coexistence> Enable, Config, Status, coexActivity, Fm_coexistence
f
1 - Enable                (0 - 1)
2 - SwallowPeriod         (0 - 255)
3 - NDividerFrefSet1     (0 - 255)
4 - NDividerFrefSet2     (0 - 255)
5 - MDividerFrefSet1     (0 - 65535)
6 - MDividerFrefSet2     (0 - 65535)
7 - CoexPllStabilizationTime (0 - 4294967295)
8 - LdoStabilizationTime  (0 - 65535)
9 - FmDisturbedBandMargin (0 - 255)
10- SwallowClkDif         (0 - 255)
.../Bt coexistence> Enable, Config, Status, coexActivity, Fm_coexistence
```

## ***Report Menu***

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Topic	Page
10.1 Set .....	2
10.2 Add .....	2
10.3 Clear .....	2
10.4 Level .....	2

Use the **Report [r]** menu to print debug information.

The Report menu sets the debug print level and severity. The code must be compiled as debug. By default, the debug traces are routed to the Ethernet port. However, there is an option to route it to the same location as the CLI.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
r
```

## 10.1 Set

Use this command to display the current debug fields. The + (plus) sign means that the file is selected for debug.

```
.../Report> Set, Add, Clear, Level
```

S

```
-----
Index   State   Desc
0       +       timer
1       +       measurementMgr
2       +       measurementMgrSM
3       +       regulatoryDomain
4       +       requestHandler
5       +       SoftGemini
6       +       spectrumMngmntMgr
7       +       SwitchChannel
8       +       roamingMgr
9       +       scanMgr
10      +       admCtrlCcx
11      +       ccxMgr
12      +       ccxRMMngr
13      +       ccxTSMngr
14      +       rogueAp
15      +       TransmitPowerCcx
16      +       admCtrl
17      +       admCtrlNone
18      +       admCtrlWep
19      +       admCtrlWpa
20      +       admCtrlWpa2
21      +       apConn
22      +       broadcastKey802_1x
23      +       broadcastKeyNone
24      +       broadcastKeySM
25      +       conn
26      +       connIbss
27      +       connInfra
28      +       keyDerive
29      +       keyDeriveAes
30      +       keyDeriveCkip
31      +       keyDeriveTkip
32      +       keyDeriveWep
33      +       keyParser
```

34	+	keyParserExternal
35	+	keyParserWep
36	+	mainKeysSm
37	+	mainSecKeysOnly
38	+	mainSecNull
39	+	mainSecSm
40	+	rsn
41	+	sme
42	+	smeSelect
43	+	smeSm
44	+	unicastKey802_1x
45	+	unicastKeyNone
46	+	unicastKeySM
47	+	CmdDispatcher
48	+	CmdHndlr
49	+	DrvMain
50	+	EvHandler
51	+	Ctrl
52	+	GeneralUtil
53	+	RateAdaptation
54	+	rx
55	+	TrafficMonitor
56	+	txCtrl
57	+	txCtrlParams
58	+	txCtrlServ
59	+	TxDataClsfr
60	+	txDataQueue
61	+	txMgmtQueue
62	+	txPort
63	+	assocSM
64	+	authSm
65	+	currBss
66	+	healthMonitor
67	+	mlmeBuilder
68	+	mlmeParser
69	+	mlmeSm
70	+	openAuthSm
71	+	PowerMgr
72	+	PowerMgrDbgPrint
73	+	PowerMgrKeepAlive
74	+	qosMgr
75	+	roamingInt
76	+	ScanCncn
77	+	ScanCncnApp
78	+	ScanCncnOsSm
79	+	ScanCncnSm
80	+	ScanCncnSmSpecific
81	+	scanResultTable
82	+	scr
83	+	sharedKeyAuthSm
84	+	siteHash
85	+	siteMgr

86	+	StaCap
87	+	systemConfig
88	+	templates
89	+	trafficAdmControl
90	+	CmdBld
91	+	CmdBldCfg
92	+	CmdBldCfgIE
93	+	CmdBldCmd
94	+	CmdBldCmdIE
95	+	CmdBldItr
96	+	CmdBldItrIE
97	+	CmdQueue
98	+	RxQueue
99	+	txCtrlBlk
100	+	txHwQueue
101	+	CmdMBox
102	+	eventMbox
103	+	fwDebug
104	+	FwEvent
105	+	HwInit
106	+	RxXfer
107	+	txResult
108	+	txXfer
109	+	MacServices
110	+	MeasurementSrv
111	+	measurementSrvDbgPrint
112	+	MeasurementSrvSM
113	+	PowerSrv
114	+	PowerSrvSM
115	+	ScanSrv
116	+	ScanSrvSM
117	+	TWDriver
118	+	TWDriverCtrl
119	+	TWDriverRadio
120	+	TWDriverTx
121	+	TwIf
122	+	SdioBusDrv
123	+	TxnQueue
124	+	WspiBusDrv
125	+	context
126	+	freq
127	+	fsm
128	+	GenSM
129	+	mem
130	+	queue
131	+	rate
132	+	report
133	+	stack

## 10.2 Add

This command adds a debug field. To use this command, type **a <value>**. To set all, use the last line, shown in the first box below, and do not use any parameters. The last line in the example below shows **138** as the maximum index. Use this index to set all the items in the table.

```
.../Report> Set, Add, Clear, Level
a
* Use '138' (max index) to set all table.
```

Use the command individually for each field.

```
.../Report> Set, Add, Clear, Level
a 100

.../Report> Set, Add, Clear, Level
a 95

.../Report> Set, Add, Clear, Level
a 90
```

The following shows a partial list of the debug fields:

```
86          StaCap
87          systemConfig
88          templates
89          trafficAdmControl
90      +    CmdBld
91          CmdBldCfg
92          CmdBldCfgIE
93          CmdBldCmd
94          CmdBldCmdIE
95      +    CmdBldItr
96          CmdBldItrIE
97          CmdQueue
98          RxQueue
99          txCtrlBlk
100      +   txHwQueue
101          CmdMBox
102          eventMbox
```



### 10.3 Clear

This command clears the debug field. To clear one field, type **c <value>**, and to clear all, type the value shown at the bottom of the list of values when sending this command without any parameter. In the example below, this value is 138.

```
.../Report> Set, Add, Clear, Level
c

0      +      timer
1      +      measurementMgr

...
...
...

132          report
133          stack
* Use '138' (max index) to clear all table.
```

### 10.4 Level

This command sets the debug severity level. Type **l <value>** to use this command.

```
.../Report> Set, Add, Clear, Level
l

Severity:
-----
Severity level  State  Desc
1              INIT
2              INFORMATION
3              WARNING
4      +      ERROR
5      +      FATAL_ERROR
6              SM
7      +      CONSOLE
* Use '0' to clear all table.
* Use '8' (max index) to set all table.
```

## ***Debug Menu***

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Topic	Page
11.1 Print [p] .....	2
11.2 Fw debug [f] Submenu .....	2

The **dEbug [e] menu** contains command for advanced debugging, including access to registers and special print files.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
e
.../dEbug> Print, Fw debug/
```

## 11.1 Print [p]

This command enables you to display debug printouts. Type **p <num>** to use this command. To display the main debug menu, type **p 0**.

```
.../dEbug> Print, Fw debug/
p 0
CuCmd_PrintDriverDebug: FUN_ID:    Debug main menu (p <num>)
0
-----
Association                100
Utils                      200
Tx                         300
Rx                         350
Ctrl                      400
SiteMgr                   500
Connection                600
Rsn                       700
Hal Ctrl                  800
QOS                      1000
Measurement               1100
PowerMgr                  1200
HAL Ctrl Buffer            1300
Scan concentrator         1400
Scan Manager              1500
Roaming Manager           1600
SCR                      1700
Soft Gemini                1800
SME                      1900
Health Monitor            2000
MIB                      2100
FW Debug                 2200
TwIf                     2300
```

## 11.2 Fw debug [f] Submenu

This submenu provides commands for configuring FW debug parameters and for setting and getting rate parameter information. Three commands are provided, as follows:

1. Debug.
2. Set rate management.
3. Get rate management.

```
.../dEbug> Print, Fw debug/
f
.../Fw debug> Debug, Set rate managment, Get rate management
```

### 11.2.1 Debug [d]

This command configures the parameter for debugging.

```
.../Fw debug> Debug, Set rate managment, Get rate management
d
FwDebug parm:
Parms buf size = 8
```

### 11.2.2 Set rate management [s]

This command sets the rate parameter in the Site Manager. To set any of the fifteen parameters, type **s <parameter id> <value>**.

```
.../Fw debug> Debug, Set rate managment, Get rate management
s
(0) RateMngRateRetryScore
(1) RateMngPerAdd
(2) RateMngPerTh1
(3) RateMngPerTh2
(4) RateMngMaxPer
(5) RateMngInverseCuriosityFactor
(6) RateMngTxFailLowTh
(7) RateMngTxFailHighTh
(8) RateMngPerAlphaShift
(9) RateMngPerAddShift
(10) RateMngPerBeta1Shift
(11) RateMngPerBeta2Shift
(12) RateMngRateCheckUp
(13) RateMngRateCheckDown
(14) RateMngRateRetryPolicy[13]
```

### 11.2.3 Get rate management [g]

This command displays the current Rate Manager parameters. To display all the parameters, type **g**. To display a specific parameter, type **g <parameter id>**, where **id** specifies the identifier of the parameter to be displayed.

```
.../Fw debug> Debug, Set rate managment, Get rate managment  
  
g  
RateMngRateRetryScore = 49264  
RateMngPerAdd = 14904  
RateMngPerTh1 = 49264  
RateMngPerTh2 = 28005  
RateMngMaxPer = 28005  
RateMngInverseCuriosityFactor = 0  
RateMngTxFailLowTh = 32  
RateMngTxFailHighTh = 0  
RateMngPerAlphaShift = 0  
RateMngPerAddShift = 1  
RateMngPerBeta1Shift = 0  
RateMngPerBeta2Shift = 0  
RateMngRateCheckUp = 0  
RateMngRateCheckDown = 188  
RateMngRateRetryPolicy = 30 10 0 72 61 144 190 16 39 0 0 96 234
```

## ***BIT Menu***

---

---

---

Topic	Page
12.1 Bip [b] Submenu .....	2

The **biT [t]** menu contains commands for the HW's Built-in Production Line Test and enhanced radio debugging.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/ , dEbug/, biT/, aboUt, Quit
t

.../biT> Bip/, Radio debug/
```

## 12.1 Bip [b] Submenu

The Bip submenu contains the API for starting the TX BIP calibration and the RX BIP calibration. There are two steps to complete the calibration, as follows:

- 1 Set the reference power
- 2 Run the TX or RX calibration.

The following shows the BIP submenu:

```
.../biT> Bip/, Radio debug/
b

.../Bip> update Buffer calref point, Tx bip, Rx bip/
```

### 12.1.1 *update Buffer calref point [b]*

This command sets a reference point for each sub-band according to the parameters provided by the front end (FE) module manufacturer.

```
.../Bip> update Buffer calref point, Tx bip, Rx bip/
b

Missing Param1: iReferencePointDetectorValue
Missing Param2: iReferencePointPower
Missing Param3: isubBand
```

### 12.1.2 *Tx bip [t]*

This command starts the actual calibration for a specific sub-band (or several sub-bands). Use 0/1 to disable/enable calibration on a specific sub-band. At the end of the process, a new buffer of calibrated parameters is created. You may refer to *Section 14.5, TX BIP* for an example describing how to use this command.

```
.../Bip> update Buffer calref point, Tx bip, Rx bip/
t

P2G Calibration: Tx bip <Sub Band B/G: 1 - 14 (0..1)>
<Sub Band A: 1 - 4 (0..1)>
<Sub Band A: 8 - 16 (0..1)>
<Sub Band A: 34 - 48 (0..1)>
<Sub Band A: 52 - 64 (0..1)>
<Sub Band A: 100 -116 (0..1)>
<Sub Band A: 120 -140 (0..1)>
<Sub Band A: 149 -165 (0..1)>
```

### 12.1.3 **Rx bip [r] Submenu**

This submenu contains the commands used to run the RX BIP.

```
.../Bip> update Buffer calref point, Tx bip, Rx bip/
r
.../Rx bip> rx Enter, rx Start, rx eXit
```

#### 12.1.3.1 **rx Enter [e]**

This command enters the RX calibration state. Use it to perform the BIP/PLT/Radio Debug tests.

```
.../Rx bip> rx Enter, rx Start, rx eXit
e
```

#### 12.1.3.2 **rx Start [s]**

This command starts the actual calibration for a specific sub-band (or several sub-bands).

```
.../Rx bip> rx Enter, rx Start, rx eXit
s

Rx Calibration: rx Start <Reference point value>
```

#### 12.1.3.3 **rx eXit [x]**

This commands stops the RX calibration.

```
.../Rx bip> rx Enter, rx Start, rx eXit
x
```

### 12.1.4 **Radio debug [r] Submenu**

The Radio debug submenu contains several commands that are used to test RX and TX without having to connect to an access point.

```
.../biT> Bip/, Radio debug/
r
.../Radio debug> Get hdk version, cHannel tune, Tx debug/, rx Statistics/
```

#### 12.1.4.1 **Get hdk version [g]**

This command retrieves HDK version information for various components. Table 19 describes the information that is obtained.

**Table 19: HDK Version**

Item	Description
ProductName	6: For WiLink6 4: For WiLink4
PgNumber	Hardware tag
SoftwareVersionLevel	SW level number (major SW change)
SoftwareVersionDelivery	Delivery number (inside any Software Version Level)
radioModuleType	The radio currently supported by the HDK module
numberOfReferenceDesignsSupported	The number of reference designs supported by the HDK module



```
.../Radio debug> Get hdk version, cHannel tune, Tx debug/, rx Statistics/
g

ProductName:                6
PgNumber:                   10
SoftwareVersionLevel:       14
radioModuleType:            0
SoftwareVersionDelivery:    166
numberOfReferenceDesignsSupported: 0
```

#### 12.1.4.2 cHannel tune [h]

A Channel Tune operation must be performed before any RX or TX operation. This command informs the FW about the TX or RX on the specified channel. You may refer to *Section 14.5, TX BIP*, for an example of how to use this command.

```
.../Radio debug> Get hdk version, cHannel tune, Tx debug/, rx Statistics/
h

Param 0 - Band (0-2.4Ghz, 1-5Ghz, 2-4.9Ghz)
Param 1 - Channel
```

#### 12.1.4.3 Tx debug [t] Submenu

This submenu configures the RF to transmit using a carrier continuous wave (CW) or a modulated signal.

```
.../Radio debug> Get hdk version, cHannel tune, Tx debug/, rx Statistics/
t

.../Tx debug> Cw, coNtinues, Stop
```

##### 12.1.4.3.1 Cw [c]

The carrier wave does not contain any data, and transmits on the specified channel.

```
.../Tx debug> Cw, coNtinues, Stop
c

Param 0 - Power (0-25000 1/1000 db)
Param 1 - Tone Type (1-Single Tone, 2-Carrier Feed Through)
```

##### 12.1.4.3.2 contiNuous [n]

This command contains the parameters used to program the radio to send packets containing different types of data.

```
.../Tx debug> Cw, coNtinues, Stop
n

Param 0 - Delay
Param 1 - Rate
Param 2 - Size
Param 3 - Amount
```

```

Param 4 - Power
Param 5 - Seed
Param 6 - Packet Mode
Param 7 - DCF On/Off
Param 8 - GI
Param 9 - Preamble
Param 10 - Type
Param 11 - Scrambler
Param 12 - Enable CLPC
Param 13 - Sequence no. Mode
Param 14 - Destination MAC Address

```

**Table 20: Rate Bitmap**

Rate	Bitmap
1 Mbps	0x00000001
2 Mbps	0x00000002
5.5 Mbps	0x00000004
6 Mbps	0x00000008
9 Mbps	0x00000010
11 Mbps	0x00000020
12 Mbps	0x00000040
18 Mbps	0x00000080
24 Mbps	0x00000200
36 Mbps	0x00000400
48 Mbps	0x00000800
54 Mbps	0x00001000
MCS_0	0x00002000
MCS_1	0x00004000
MCS_2	0x00008000
MCS_3	0x00010000
MCS_4	0x00020000
MCS_5	0x00040000
MCS_6	0x00080000
MCS_7	0x00100000

**Table 21: Continuous Parameters**

Parameter	Description
iDelay	Delay between packets, in microseconds
iRate	You may refer to Table 20
iSize	Size of packet, in bytes
iAmount	The number of packets, if there are multiple packets
iPower	The upper power limit, in dBm

Parameter	Description
iSeed	This is the scrambler seed used to initialize it.
iPacketMode	0: Single 1: Multiple 2: Infinite Length 3: Continuous 4: FCC
iDcfOnOff	Use DCF access (1)
iGI	Guard interval: 0: Long (800 ns) 1: Short (400 ns)
iPreamble	0: Long 1: Short 4: OFDM 6: Mixed 7: GF
iType	0: Data 1: Ack 2: Probe request 3: Random 4: User defined 5: PER
iScrambler	0: Off 1: On
iEnableCLPC	Range: 0 - 100
	0: Disable calibration
	1-99: Entering any of these values enables the calibration assessment and sets the ped, and each step represents 200ms. For example, if the user enters a value of 6, the calibration assessment executes every 1.2 seconds. If the value is out of range, the value is changed to 25, which represents five seconds.
iSeqNumMode	0: Fixed sequence number 1: Incremental - used for PER test only
iSrcMacAddr	Source address (BSSID) - used for PER test only
iDstMacAddr	Destination address - used for PER test only

### 12.1.4.3.3 Stop [s]

This command is used to stop the RF from transmitting.

```
.../Tx debug> Cw, coNtinues, Stop
s
Plt Tx Stop was OK
```

#### 12.1.4.4 rx Statistics [s] Submenu

This submenu contains the commands to start RX statistics. To perform an RX test, you must reset the statistics, begin gathering the statistics, stop statistics collection and read the statistics. You may refer to *Section 14.9, RX Statistics*.

The following provides a use case example.

```
.../Radio debug> Get hdk version, cHannel tune, Tx debug/, rx Statistics/
s
.../rx Statistics> rx stat Start, rx stat stoP, rx stat Reset, rx stat Get
```

##### 12.1.4.4.1 rx stat Start [s]

This command begins gathering RX statistics.

```
.../rx Statistics> rx stat Start, rx stat stoP, rx stat Reset, rx stat Get
s
Start RX Statistics OK
```

##### 12.1.4.4.2 rx stat stoP [p]

Use this command to complete the gathering of statistics.

```
.../rx Statistics> rx stat Start, rx stat stoP, rx stat Reset, rx stat Get
p
Stop RX Statistics OK
```

##### 12.1.4.4.3 rx stat Reset [r]

Use this command to clear all the information collected during the RX statistics' collection process.

```
.../rx Statistics> rx stat Start, rx stat stoP, rx stat Reset, rx stat Get
r
Reset RX Statistics OK
```

##### 12.1.4.4.4 rx stat Get [g]

Use this command to obtain the statistics.

```
.../rx Statistics> rx stat Start, rx stat stoP, rx stat Reset, rx stat Get
g
Received Valid Packet no.: 0(0x0)
Received FCS Error Packet no.: 0(0x0)
Received Address mismatched packet: 0(0x0)
Sequence Number Missing Count: 0(0x0)
Average SNR: 0(0x0)
Average RSSI: 0(0x0)
Base Packet ID: 0(0x0)
Number of Packets: 0(0x0)
Number of Missed Packets: 0(0x0)
```

*This page was intentionally left blank.*

## ***General Commands***

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Topic	Page
13.1 about [u].....	2
13.2 Quit [q] .....	2

This chapter describes other, general CLI-related commands.

### 13.1 about [u]

This command fetches the loaded FW and driver versions.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,  
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit  
  
u  
  
Driver version: WiLink_Driver_6.1.0.0.95_M3_NOCCX  
Firmware version: Rev 6.1.0.0.241
```

### 13.2 Quit [q]

Use this command to exit the CLI configuration utility.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,  
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit  
  
q  
  
#
```

## ***Use Cases***

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This chapter describes several use cases. There are several scenarios in which you may need to configure different parts of the driver in order to obtain a specific configuration or to be able to perform an activity. For example, to be able to access the QoS parameters of the AP, the station must be connected to the AP.

The use cases described in this chapter contain the sequence of the CLI commands to be used and the CLI logs. Characters in **red** indicate what the user types. Characters in **blue** represent the output from the CLI after executing the command.

## 14.1 Security Examples

There are several security configurations possible with the WL6.1. This section provides examples for:

- WEP configuration, page 2
- WPA-PSK configuration, page 2
- WPA2-PSK configuration, page 2

### 14.1.1 Enabling WEP

Wired Equivalence Privacy (WEP) is the first algorithm used to protect the WLAN networks. It can be easily cracked in a few minutes. Therefore, it should not be used when stronger protection is required. To configure the station to use WEP, perform the following steps:

- 1 Start the driver (if it is not already started).
- 2 Set the Management mode to manual (1).
- 3 Set the authentication to open (0).
- 4 Set the encryption as WEP.
- 5 Add the WEP.

The complete script for these actions is shown below:

```
/ d s
/ m d 1
/ p a 0
/ p w a 88f2c58643 1 1 hex
```

Below are some of the logs associated with the script above.

- 1 Start the driver, if it has been stopped.

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
d s

.../Driver> Start, sTop, stAtus
SDIO clock Configuration is now set to 24Mhz
CHIP VERSION... set 1273 chip top registers
Working on a 1273 PG 2.0 board.
Starting to process NVS...
NVS found, EEPROM Image addr=0xc0768e00, EEPROM Len=0x0x14c
Chip ID is 0x4030111.
FEM Type 1
Starting to download firmware...
Starting to download firmware...
Starting to download firmware...
```

```
Starting to download firmware...
Starting to download firmware...
Starting to download firmware...
Finished downloading firmware.
Firmware running.

-----

Driver Version   : WiLink_Driver_6.1.0.0.95_M3
Firmware Version: Rev 6.1.0.0.241
Station ID      : 08-00-28-12-34-56
-----

.../Driver> Start, sTop, stAtus
a

Interrogate TX/RX parameters

=====
Status      : running
MAC         : 08.00.28.12.34.56
SSID        : <empty>
BSSID       : 00.00.00.00.00.00
Channel     : <empty>
=====
.../Driver> Start, sTop, status
```

## 2 Set the Management mode to manual (1).

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
m

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
d 1

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
d

Current mode = SME Manual
0 - SME Auto, 1 - SME Manual
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassph
rase, cerTificate, Supplicant/, Wep/
a 0

Setting privacy authentication to 0
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassph
rase, cerTificate, Supplicant/, Wep/
r

0 - None, 1 - WEP, 2 - TKIP, 3 - AES
```

```

.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassph
rase, cerTificate, Supplicant/, Wep/
r 1

Setting privacy encryption to 1

.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassph
rase, cerTificate, Supplicant/, Wep/
w

.../Wep> Add, Remove, Get default key id
a

Add WEP: Add <Key Value (0..64 chars)>
<Tx Key Index>
<Default Key (yes - 1 /no - 0)>
[key type (hex | text) [hex] (0..5 chars)]

.../Wep> Add, Remove, Get default key id
a 88f2c58643 1 1 hex

.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
c peterpan

14
Trying to associate with SSID 'peterpan'
OK
***** NEW CONNECTION *****
-- SSID = peterpan
-- BSSID = 0-f-b5-e6-ed-fc
*****
Associated with 00:0f:b5:e6:ed:fc
CTRL-EVENT-CONNECTED - Connection to 00:0f:b5:e6:ed:fc completed (reauth) [id=14 id_str=]

```

## 14.1.2 Enabling WPA-PSK

WiFi Protected Access (WPA) is a stronger Protection mode than WEP. WPA was used as an intermediate step, instead of WEP, before the full 802.11i features provided by WPA2 were implemented. The encryption feature uses the Temporal Key Integrity Protocol (TKIP) to configure the station to use this Security mode, set the authentication to WPA-PSK, select TKIP as the encryption, set the password and finally to connect to the AP. To enable WPA, perform the following steps:

- 1 Set the Connect mode to manual.
- 2 Set the authentication to WPAPSK.
- 3 Set the encryption as TKIP.
- 4 Set the passphrase.
- 5 Connect to the AP.

```

.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, si
Gnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/, beacoN/,
adVanced/
d
Current mode = SME Auto
0 - SME Auto, 1 - SME Manual
.../Management> connect moDe, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, si
Gnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/, beacoN/,
adVanced/
d 1
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
a 4
Setting privacy authentication to 4
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
r
0 - None, 1 - WEP, 2 - TKIP, 3 - AES
Encryption = 0
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
r 2
Setting privacy encryption to 2
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpamode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
p osopanda
Setting PSKPassphrase to osopanda

\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
c c peterpan

.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
Trying to associate with SSID 'peterpan'
OK

```

```
Associated with 00:0f:b5:e6:ed:fc
***** NEW CONNECTION *****
-- SSID = peterpan
-- BSSID = 0-f-b5-e6-ed-fc
*****
WPA: Key negotiation completed with 00:0f:b5:e6:ed:fc [PTK=TKIP GTK=TKIP]
CTRL-EVENT-CONNECTED - Connection to 00:0f:b5:e6:ed:fc completed (reauth) [id=23 id_str=]
L-EVENT-CONNECTED - Connection to 00:0f:b5:e6:ed:fc completed (reauth) [id=23 id_str=]
```

### 14.1.3 Enabling WPA2-PSK [AES]

The WPA2 is a stronger protection protocol than WPA. It is based on an Advanced Encryption Standard (AES) algorithm. The Pre-Shared Key (PSK) mode is designed for residential and networks that do not require the complexity of an authentication server. To set up the station correctly use this Security mode. You must then configure the authentication to WPA2-PSK, the encryption to AES and then set the passphrase. This security is vulnerable to brute force attacks, thus it is recommended to use a long and complex password.

- 1 Set the authentication to WPA2PSK.
- 2 Set the encryption as AES.
- 3 Set the passphrase.
- 4 Connect to the AP.

```
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpmode, Credentials,
pskPassph
rase, cerTificate, Supplicant/, Wep/
a 7
Setting privacy authentication to 7
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpmode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
r 3
Setting privacy encryption to 3
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpmode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
p aabbccdde
Setting PSKPassphrase to aabbccdde
.../Privacy> Authentication, Eap, encRyption, Keytype, Mixedmode, aNywpmode, Credentials,
pskPassphrase, cerTificate, Supplicant/, Wep/
/ c c peterpan
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
0
Trying to associate with SSID 'peterpan'
OK
Associated with 00:0f:b5:e6:ed:fc
WPA: Could not find AP from the ***** NEW CONNECTION *****
scan results
-- SSID = peterpan
-- BSSID = 0-f-b5-e6-ed-fc
*****
WPA: Key negotiation completed with 00:0f:b5:e6:ed:fc [PTK=CCMP GTK=CCMP]
CTRL-EVENT-CONNECTED - Connection to 00:0f:b5:e6:ed:fc completed (auth) [id=0 id_str=]
```

## 14.2 Application Scan

In this use case, the station is configured for a one-shot application scan. In the example below, the application scan is configured with the following characteristics:

- No specific SSID
- Active scan
- 2.4GHz band
- Three probe requests (PRs) per channel
- A 1Mbps PR rate
- Scanning of five channels (2, 3, 6, 9 and 10)
- A Maximum Dwell Time of 70 ms per channel
- Minimum Dwell Time of 40 ms per channel
- No early termination
- TX power of 100

```
.../configApp> Global, Channel, cLear, Display
g <empty> 1 0 3 1 0 15
c 0 ff:ff:ff:ff:ff:ff 70000 40000 0 0 100 2
c 1 ff:ff:ff:ff:ff:ff 70000 40000 0 0 100 3
c 2 ff:ff:ff:ff:ff:ff 70000 40000 0 0 100 6
c 3 ff:ff:ff:ff:ff:ff 70000 40000 0 0 100 9
c 4 ff:ff:ff:ff:ff:ff 70000 40000 0 0 100 10
.../configApp> Global, Channel, cLear, Display
d

Application Scan params:
SSID: , Type: Active Normal Scan
Band: 2.4 GHz, Number of probe req:3, probe req. rate:1 Mbps
Tid :0
```

Channel	BSS ID	Max time	Min time	ET event	ET frame num	Power
2	ff.ff.ff.ff.ff.ff	70000	40000	ET disabled	0	100
3	ff.ff.ff.ff.ff.ff	70000	40000	ET disabled	0	100
6	ff.ff.ff.ff.ff.ff	70000	40000	ET disabled	0	100
9	ff.ff.ff.ff.ff.ff	70000	40000	ET disabled	0	100
10	ff.ff.ff.ff.ff.ff	70000	40000	ET disabled	0	100

As shown below, the scan found one AP on channel 3:

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
b

Bssid List: Num=1
```

MAC	Privacy	Rssi	Mode	Channel	SSID
00.0f.b5.e6.ed.fc	0	-82	Infra	3	peterpan

In the next example, the station is configured with the following characteristics:

- SSID: net4guest
- Active scan
- 2.4GHz band
- Three PRs per channel
- A 1Mbps PR rate
- Scanning of five channels (1, 3, 6, 11 and 12)
- Maximum Dwell Time of 90 ms per channel
- A Minimum Dwell Time of 40 ms per channel
- No early termination
- TX power of 160

```
.../configApp> Global, Channel, cLear, Display
g net4guest 1 0 3 1 0 5
c 0 ff:ff:ff:ff:ff:ff 90000 40000 0 0 160 1
c 1 ff:ff:ff:ff:ff:ff 90000 40000 0 0 160 3
c 2 ff:ff:ff:ff:ff:ff 90000 40000 0 0 160 6
c 3 ff:ff:ff:ff:ff:ff 90000 40000 0 0 160 11
c 4 ff:ff:ff:ff:ff:ff 90000 40000 0 0 160 12

.../configApp> Global, Channel, cLear, Display
d

Application Scan params:
SSID: net4guest, Type: Active Normal Scan
Band: 2.4 GHz, Number of probe req:3, probe req. rate:1 Mbps
Tid :0
```

Channel	BSS ID	Max time	Min time	ET event	ET frame num	Power
1	ff.ff.ff.ff.ff.ff	90000	40000	ET disabled	0	160
3	ff.ff.ff.ff.ff.ff	90000	40000	ET disabled	0	160
6	ff.ff.ff.ff.ff.ff	90000	40000	ET disabled	0	160
11	ff.ff.ff.ff.ff.ff	90000	40000	ET disabled	0	160
12	ff.ff.ff.ff.ff.ff	90000	40000	ET disabled	0	160

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
b

BssId List: Num=1
      MAC      Privacy Rssi  Mode   Channel   SSID
00.15.2b.78.f1.91    0   -60  Infra     1     net4guest
```

### 14.3 Periodic Scan

This use case describes how to configure for periodic scanning. In the example below, the application scan is configured with the following characteristics:

- **RSSI Threshold (-100..0):** -90 dBm
- **SNR threshold (-10..100):** 0 dB
- **Report threshold (1..8):** 2
- **Terminate on report (0..1):** 0
- **BSS Type (0 - independent; 1 - infrastructure; 2 - any) (0..2):** 1
- **Probe request number (0..5):** 3
- **Number of scan cycles (0..100):** 10
- **Number of SSIDs (0..8):** 3
- **Number of channels (0..32):** 5
- **Interval (in millisec) (0..3600000):** 5000 (5 seconds)
- **Ssid:** peterpan (visible), net4guest (hidden), heleoka (hidden)
- **Channel index (0..32):** 0 to 4
- **Band (0-2.4 GHz, 1-5 GHz) (0..1):** 0 (2.4 GHz for all five channels)
- **Channel (0..180):** 1, 3, 6, 10, 11
- **Scan type (0 - passive; 1 - active) (0..1):** 1
- **Minimum Dwell Time (in millisec) (1..1000):** 80
- **Maximum Dwell Time (in milliseconds) (1..1000):** 30
- **TX power level (dBm\*10) (0..250):** > 150

```
.../configpEriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
g -90 0 2 0 1 3 10 3 5
i 0 5000
i 1 5000
i 2 5000
i 3 5000
i 4 5000
i 5 5000
i 6 5000
i 7 5000
i 8 5000
i 9 5000
c 0 0 1 1 30 80 150
c 1 0 3 1 30 80 150
c 2 0 6 1 30 80 150
c 3 0 10 1 30 80 150
c 4 0 11 1 30 80 150
s 0 0 peterpan
s 1 1 net4guest
s 2 1 halekoa75
```



```
.../configPeriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
d

Application Periodic Scan parameters:
RSSI Threshold: -90, SNR Threshold: 0, Report Threshold: 2 Number of cycles: 10
Terminate on Report: False, BSS type: Infrastructure, Probe Request Number: 3

Intervals (msec):
5000 5000 5000 5000 5000 5000 5000 5000 5000 5000 30000 30000 30000 30000 30000 30000

SSIDs:
peterpan (Public), net4guest (Hidden), halekoa75 (Hidden),

Channels:
Band          Channel    Scan type          Min dwell time  Max dwell time  Power level
(dBm*10)
-----
2.4 GHz       1          Active Normal Scan  30              80              150
2.4 GHz       3          Active Normal Scan  30              80              150
2.4 GHz       6          Active Normal Scan  30              80              150
2.4 GHz       10         Active Normal Scan  30              80              150
2.4 GHz       11         Active Normal Scan  30              80              150
```

### 14.3.1 Changing to Manual Mode for a Periodic Application Scan

During Auto mode, the station cannot start any periodic application scan. The Connection mode must be changed to manual. In the example below, the state machine entity (SME) is in Auto mode, and when asked to do a periodic scan, it fails.

```
Gnal, snr ratio0, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/, beacoN/,
adVanced/
d

Current mode = SME Auto
0 - SME Auto, 1 - SME Manual

.../configPeriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
t

Scan was not started. Verify scan parameters or SME mode
ERROR - IPC_STA_Private_Send - error sending Wext private IOCTL to STA driver (ioctl_cmd =
8021503,
res = -1, errno = 95)
```

When changed to Manual mode, the driver can send the periodic application scan command, as shown below:

```
.../Management> connect mode, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
d 1
.../Management> connect mode, Channel, Rate, Mode, Frag, rTs, prEamble, sLot, rAdio on/off,
Info, siGnal, snr ratio, tX_power_table, tx_power_dBm_div10, tx_poWer_level, 802_11d_h/,
beacoN/, adVanced/
d

Current mode = SME Manual
0 - SME Auto, 1 - SME Manual
.../configpEriodic> Global, Interval, Ssid, Channel, cLear, Display, sTart, stoP
t

Periodic application scan started.
```

## 14.4 Roaming

This use case describes how to configure the background scan for roaming activities. There are three scan types used to help maintain a list of roaming candidates (tracking list):

- Discovery
- Tracking
- Immediate

The discovery scan is performed first during the scan cycle to populate the tracking list, if the current list is below a threshold. Then, the tracking scan periodically updates the roaming candidate list. The immediate scan is not part of the scan cycle, but is used if the station needs to roam immediately, and the roaming candidates list is empty.

To test, run a background scan, ensuring that the station is connected to an AP. In the following example, there are two APs with the same SSID, roaming is enabled in the driver and the scan is configured using the scan policy commands.

The following are the commands used to configure and monitor the background scan and roaming:

- Display current scan policy.
- Change the policy to enable APs with an RSSI as low as -90 dBm.
- Store the scan policy to activate the background scan.
- Enable roaming.
- Set the roaming event to check when roaming has completed (optional).
- Check the BSS list.

Below are the current scan results using a one-shot application scan:

```
.../Connection> Bssid_list, Connect, Disassociate, Status, Full_bssid_list, wPs/
b

BssId List: Num=4

      MAC          Privacy Rssi  Mode   Channel   SSID
00.15.2b.78.f1.90    1    -61  Infra     1      ****
00.15.2b.78.f1.91    0    -71  Infra     1      ****
00.0f.b5.e6.ed.fc    0    -85  Infra     3    linksys
*00.23.69.37.c3.9f    0    -85  Infra    11    linksys
```

The scan policy is currently set as:

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslistT
d

Scan Policy:
Normal scan interval: 10000, deteriorating scan interval: 5000
Max track attempt failures: 3
BSS list size: 4, number of BSSes to start discovery: 1
Number of configured bands: 1

Band: 2.4 GHz
RSSI Threshold: -80 dBm
Number of channels for each discovery interval: 3

Tracking Method:
Scan type: Active Normal Scan
Max channel dwell time: 30000, Min channel dwell time: 15000
ET condition: ET disabled , ET number of frames: 0
Probe request number: 3, probe request rate: Auto , TX level: 205

Discovery Method:
Scan type: Active Normal Scan
Max channel dwell time: 30000, Min channel dwell time: 15000
ET condition: ET disabled , ET number of frames: 0
Probe request number: 3, probe request rate: Auto , TX level: 205

Immediate Scan Method:
Scan type: Active Normal Scan
Max channel dwell time: 30000, Min channel dwell time: 15000
ET condition: ET disabled , ET number of frames: 0
Probe request number: 3, probe request rate: Auto , TX level: 205

Channel list:  1  2  3  4  5  6  7  8  9 10 11 12 13 14
.../configPolicy> Global, Band/, Display, cLear, Store, bsslistT
```

The candidate APs have an RSSI of -85. From the scan policy above, the background scan only updates the BSS list if the candidate has an RSSI greater than or equal to -80 dBm.

```
00.0f.b5.e6.ed.fc      0      -85  Infra      3      linksys
*00.23.69.37.c3.9f    0      -85  Infra     11      linksys
```

By using the miscellaneous command, the tracking list is updated with APs with the same SSID, if their RSSI is as low as -90 dBm.

```
.../Band> Misc, Channel, Track, Discovery, Immediate
/ a p b m 0 0 -90 14 14
```

You then need to store the scan policy.

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslistT
/ a p s
Scan policy stored.
```

This step is optional, but it helps for verifying that roaming has occurred. This command sets the event IPC\_EVENT\_ROAMING\_COMPLETE. Below, a warning is received, indicating that this event is already enabled. If the event was not registered, no string is received to confirm that the event is registered.

```
/ v r 18

\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
.../eVents> Register, Unregister
CuCmd_RegisterEvents, event ROAMING_COMPLETE is already enabled!
```

To ensure that roaming is enabled:

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/, eVents/,
Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
/ g e

.../roaminG> Enable, Disable, Low pass filter, Quality threshold, Get , Thresholds/
Roaming is enabled
```

To check the BSS list:

```
.../configPolicy> Global, Band/, Display, cLear, Store, bsslistT
t

BSS List:
BSSID          Band      Channel  RSSI  Neighbor?
-----
00.0f.b5.e6.ed.fc  2.4 GHz  3        -85   No
```

When the roaming is completed:

```
***** NEW CONNECTION *****
-- SSID = linksys
-- BSSID = 0-f-b5-e6-ed-fc
*****
IpcEvent_PrintEvent - received IPC_EVENT_ROAMING_COMPLETE
Associated with 00:0f:b5:e6:ed:fc
CTRL-EVENT-CONNECTED - Connection to 00:0f:b5:e6:ed:fc completed (reauth) [id=12 id_str=]
```

## 14.5 TX BIP

The TX BIP is part of the calibration performed at the customer assembly line. When using a 1271 module, only use the single-band BIP command. For a 1273 module, you can use the dual-band BIP procedure, which essentially runs the same commands over different 5GHz sub-bands. The examples below use the reference points for the TrinQuint (TQM679002 PG2.0) Front End Module (FEM). Ensure that you are using your vendors' FEM reference points.

### 14.5.1 Single-band BIP Command Example

The following are the steps required to properly perform the TX calibration:

- 1 Put a 50Ohm termination on the RF connector.
- 2 Set the Power mode to awake: / w p 1.
- 3 Change the power level to active: / w l 2.
- 4 Modify the default power level to active: / w f 2.
- 5 Set the channel and band: / t r h 0 7.
- 6 Enter the reference voltage and power gain for the FEM: / t b b 375 128 0.
- 7 Start the TX BIP: / t b t 1 0 0 0 0 0 0.
- 8 You now have a new NVS file in your setup.
- 9 Ensure that you have a unique MAC address.

These are the commands used in the CLI for the steps above:

```
/ w p 1
/ w l 2
/ w f 2
/ t r h 0 7
/ t b b 375 128 0
/ t b t 1 0 0 0 0 0 0
```

Below is a log example of the calibration:

- Set the Power mode to awake:

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/,
eVents/, Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
w
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable
p 1
```

- Change the power level to active:

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable
```

```
l 2
```

- Modify the default power level to active:

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable
```

```
f 2
```

- Check the values just set:

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable
```

```
p
```

```
Power mode: 1
```

```
0 - AUTO, 1 - ACTIVE, 2 - SHORT_DOZE, 3 - LONG_DOZE
```

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable
```

```
l
```

```
Power Level PowerSave is: Awake
```

```
0 - Extreme Low Power, 1 - Power Down, 2 - Awake
```

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable
```

```
f
```

```
Power Level Default is: Awake
```

```
0 - Extreme Low Power, 1 - Power Down, 2 - Awake
```

```
.../poWer> set_Power_mode, set_powersave_powerLevel, set_deFault_powerlevel,
set_doZe_mode_in_auto, traffic_Thresholds, eNable, Disable
```

- Set the channel and band: / t r h 0 7

```
.../Radio debug> Get hdk version, cHannel tune, Tx debug/, rx Statistics/
```

```
/ t r h 0 7
```

```
Channel tune of channel 7 was performed OK
```

- Enter the reference voltage and power gain for the FEM: / t b b 375 128 0

```
\> Driver/, Connection/, Management/, Show/, Privacy/, scAn/, roaminG/, qOs/, poWer/,
eVents/, Bt coexistence/, Report/, dEbug/, biT/, aboUt, Quit
```

```
.../biT> Bip/, Radio debug/
```

```
.../Bip> update Buffer calref point, Tx bip, Rx bip/
```

```
b 375 128 0
```

```
BufferCalReferencePoint was configured successfully
```

- Start the TX BIP, and check to see that your MAC address is unique.

```
.../Bip> update Buffer calref point, Tx bip, Rx bip/
t 1 0 0 0 0 0 0 0

Entering FillMACAddressToNVS
Mac[0]=08
Mac[1]=00
Mac[2]=28
Mac[3]=12
Mac[4]=34
Mac[5]=56
exiting FillMACAddressToNVS
```

### 14.5.2 Dual-band BIP Command Example

The Dual-band BIP procedure is similar to the single-band one, but must run over all the sub-bands. The example below demonstrates the calibration on channel 7 for 2.4GHz band, and channels 36, 60 and 154 for the 5GHz band.

The following steps must be performed:

- 1 Put a 50Ohm termination on the RF connector and perform steps 2 through 4.
- 2 Download and run the FW.
- 3 Go to Awake mode:

```
/ w p 1
/ w l 2
/ w f 2
```

- 4 Run the following TX BIP commands:

```
/ t r h 0 7
/ t b b 423 128 0
/ t b t 1 0 0 0 0 0 0 0
/ t r h 1 36
/ t b b 451 128 3
/ t b t 0 0 0 1 0 0 0 0
/ t r h 1 60
/ t b b 472 128 4
/ t b t 0 0 0 0 1 0 0 0
/ t r h 1 153
/ t b b 553 128 7
/ t b t 0 0 0 0 0 0 0 1
```

- 5 You now have a new NVS file in your setup.
- 6 Ensure that your MAC address is updated and unique.

## 14.6 Editing the MAC Address

After the TX BIP runs, there is a new file called **nvs\_map.bin** in Linux that contains the MAC address and the calibration data. The document *SWAA044\_NVS\_INI\_File\_Functions\_AN.pdf* contains the format of the NVS file.

If MAC address fields are manually edited with a hex editor, the byte order should be low byte first, followed by the high byte:

- MAC address low register (offset 0x01 to 0x02)
- MAC address LSB (offset 0x3 to 0x06)
- MAC address high register (offset 0x08 to 0x09)
- MAC address MSB (offset 0x0A to 0x0D)

The MAC address LSB and MAC address MSB, respectively, are shown in bold in the following code for 08:00:28:12:34:56:

```
0000: 01 6d 54 56 34 12 28 01 71 54 00 08
```

For 11:22:33:44:55:66:

```
0000: 01 6d 54 66 55 44 33 01 71 54 22 11 00 00
```

Using a hex editor, you should change the bold numbers to the MAC address you want to use.

## 14.7 Continuous TX

To use continuous TX, you must perform the following steps:

- 1 Set the DUT to active and Awake mode using the power configurations.
- 2 Restart the driver and reload the FW in order to flush some of the old values in the FW. This is done using the driver commands.
- 3 Stop any other activities on the station, such as transmission or reception of packets, before starting the continuous TX.
- 4 Configure the band and channel.
- 5 Send the continuous TX command with the required parameters. These parameters are specified in the *CLI User Manual*.

Each of these steps is described below in more detail:

- 1 Set Power mode to active and awake:

```
/ w p 1
/ w f 2
/ w l 2
```

- 2 Go to the BiT menu and the Radio Debug menu:

```
/ t r
```

- 3 Perform a channel tune operation:

```
h 0 11
```

- 4 Go to the TX menu:

```
t
```



## 5 Use any of the following commands, as needed:

```
n <15 parameters>
```

```
Param 0 - Delay
Param 1 - Rate
Param 2 - Size
Param 3 - Amount
Param 4 - Power
Param 5 - Seed
Param 6 - Packet Mode
Param 7 - DCF On/Off
Param 8 - GI
Param 9 - Preamble
Param 10 - Type
Param 11 - Scrambler
Param 12 - Enable CLPC
Param 13 - Sequence no. Mode
Param 14 - Destination MAC Address
```

For example:

- **0 – Delay:** 2000 ( 2 ms)
- **1 – Rate:** 4,096 (54 Mbps)
- **2 – Size:** 1,000 bytes
- **3 – Amount:** 0 (There is no need to know how many are being sent, as Continuous mode is in use.)
- **4 – Power:** 16,375
- **5 – Seed:** 0
- **6 – Packet Mode:** 3 (continuous)
- **7 – DCF On/Off:** 0 (off)
- **8 – GI:** 0 (long 800 ns)
- **9 – Preamble:** 4 (OFDM)
- **10 – Type:** 0 (Data)
- **11 – Scrambler:** 0 (off)
- **12 – Enable CLPC:** 1 (enabled)
- **13 – Sequence no. Mode:** 1 (incremental)
- **14 – Destination MAC Address:**

```
n 2000 4096 1000 0 16375 0 3 0 0 4 0 0 1 1 11:22:33:44:55:66
```

Here is the complete script for a 54Mbps rate:

```
/ w p 1 f 2
/ t r h 0 11
/ t r t n 2000 4096 1000 0 16375 0 3 0 0 4 0 0 1 1 11:22:33:44:55:66
```

In order to transmit in 11N mode (MCS7), you must run the following command:

```
/ t r t n 2000 1048576 1000 0 15875 0 3 0 0 6 0 0 1 0 11:22:33:44:55:66
```

In order to transmit in 11B mode (Rate 11), you must run the following command:

```
/ t r t n 2000 32 2048 0 22125 0 3 0 0 0 0 1 1 11:22:33:44:55:66
```

To stop the continuous transmission:

```
/ t r t s
```

## 14.8 Duty Cycle

For the duty cycle, use the same command as for the continuous TX. There is no specific command that sets the duty cycle. You should use the delay between packets, the packet size and the data rate to calculate the duty cycle.

## 14.9 RX Statistics

This command provides useful information about the performance of the receiver, such as the PER and RSSI measurements. The following steps are required before starting the collection of the RX measurements. The first step is to tune a desired channel and band. The next step is to reset the statistics to clear any previous values. After this, the RX statistics must be started in order to begin recording measurements. Finally, statistics can stop being collected.

- 1 Tune the channel and band.

```
/ t r h <Band> <Channel>
```

- 2 It is a good idea to reset the RX statistics, in case any are saved.

```
/ t r s r
```

- 3 Start the RX statistics.

```
/ t r s s
```

- 4 Obtain the RX statistics.

```
/ t r s g
```

- 5 Stop the RX statistics.

```
/ t r s p
```

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