



Laird Command Line Utility Documentation

Wi-Fi Products

Version 2.2

global solutions: local support™

Embedded Wireless Solutions Support Center: <http://ews-support.lairdtech.com>

Americas: +1-800-492-2320 Option 2

Europe: +44-1628-858-940

Asia: +852-2923-0610

www.lairdtech.com/wireless

REVISION HISTORY

Version	Date	Change Description	Approved By
1.0		Initial Version	Ron Seide
1.1	10/25/2011	Changed order of some CLI commands	Ron Seide
1.2	10/27/2011	Updated CLI commands	Ron Seide
1.3	01/12/2012	Updated Profile Subcommands	Ron Seide
1.4	03/20/2012	Updated and added CLI commands	Ron Seide
1.5	10/22/2012	Changed for new syntax order and missing listed parameters	Ron Seide
2.0	05 Mar 13	Converted to Laird formatting	Ron Seide
2.1	10 Mar 14	Removed Summit/SDC/Summit Data Communications references Added the following options/properties: <ul style="list-style-type: none">a-channel-setaddressttls-inner-methodnetmaskdate-checkgatewayfipsbroadcastprobe-delayscanignore-null-ssidstateauto-profilebridge-portsusercert_passwordshowauto-profileaddautoremovedhcp Removed the following options: <ul style="list-style-type: none">nmodeauto-completionactivate_currentactivate_global_settings	Ron Seide
2.2	29 Jul 14	Added init command. Merged WB40 and WB45-Specific Information . Added anonymous (outer) user identity configuration information.	Andrew Chen

CONTENTS

About the Command Line Interface for Laird Wi-Fi Devices	4
Available CLI Commands	4
'help' or '?'	4
Top Level Commands	4
Auto-profile	4
Disable	5
Enable	5
Exit/Quit	5
Global	5
Profile	7
Scan	10
Status	10
Stop Using	10
Using	10
Version	10
Linux Specific CLI Commands	10
iface	10
Example Linux Commands and Output.....	12
Input Examples.....	12
Single command from command line.....	12
Interactive	12
Using a pipe	12
File redirection	12
Scan Output	13
Profile Examples	14
WB40 and WB45-Specific Information	17
WB4X CLI Commands	17
Activate Global Settings	17
WB4X Settings	17

ABOUT THE COMMAND LINE INTERFACE FOR LAIRD WI-FI DEVICES

The Laird Command Line Interface (also referred to in this document as CLI and `sdc_cli`) is a utility for creating, updating, and deleting configurations for Laird's wireless cards and embedded systems (WB4xn devices). This tool offers the ability to script profile creation and deletion for the purposes of automated testing and easier deployment. The utility uses a simple chained argument string, allowing for intuitive navigation of available options.

The interface to the utility allows for interactive commands as well as the ability to send scripted commands to the utility through file redirection (such as `sdc_cli <list_of_commands.txt>`).

In interactive mode, the prompt is `sdc#`. From this point, all commands can be input. Under Linux, there is support for the bang (!) command to issue shell commands (such as `!ls`).

Note: Some commands are specific to the Laird WB40NBT and WB45NBT. These are covered in the section

AVAILABLE CLI COMMANDS

'help' or '?'

Both `help` and `?` serve the same function: they either list the available commands or list current usage notes. These commands can be used after every command or subcommand to show a list of available options.

For example:

```
sdc_cli profile <profile name> set eaptype ?
```

Top Level Commands

- [Auto-profile](#)
- [Disable](#)
- [Enable](#)
- [Exit/Quit](#)
- [Global](#)
- [Profile](#)
- [Scan](#)
- [Status](#)
- [Stop Using](#)
- [Using](#)
- [Version](#)

Note: Not all commands are supported on all hardware or operating systems. This guide has sections for [Linux Specific CLI Commands](#) as well as [WB40 and WB45-Specific Information](#).

Auto-profile

Manages the auto-profile mode.

```
auto-profile
```

Values

- On
- Off
- List
 - Enable <profile>
 - Disable <profile>
 - Clear
 - Show

Disable

Disables the wireless radio.

disable

Enable

Enables the wireless radio.

enable

Exit/Quit

If in interactive mode, this allows you to exit the utility.

[exit/quit]

Global

Sets global variables for the radio.

Example: **sdc_cli global <show|set> <property> <value>**

Available global options are:

Property	Description	Value
aggressive-scan-timer	Scans for available access points when set to On and current access point connection is tenuous	on or off (can't currently enter 1 or 0)
auth-server-type	Indicates the type of authentication server being used for EAP	acs or 1 – Sets a value of zero (0) in the profiles config file sbr or 2 – Sets a value of one (1) in the profiles config file
Note: See WB40 and WB45-Specific Information for WB4X version.		
a-channel-set	Sets a specific set of channels to operate on in the 5 GHz band. Valid operating channels are constrained by the configured regulatory domain.	Valid channels vary depending on selected regulatory domain. For FCC: 36,40,44,48,52,56,60,64,100,104,108,112,116,120,124,128,132,136,140,149,153,157,161,165 or Full or 0 (setting it to 0 disables all channels) Note: Enter channels as a comma-separated list with no spaces. See WB40 and WB45-Specific Information for WB4X version.
bg-channel-set	Sets a specific set of channels to operate on in the 2.4 GHz band. Valid operating channels are constrained by the configured regulatory domain	1,2,3,4,5,6,7,8,9,10,11,12,13,14 or Full or 0 (setting it to 0 disables all channels) Note: Enter channels as a comma-separated list with no spaces. See WB40 and WB45-Specific Information for WB4X version.
bt-coexist	Enables or disables Bluetooth coexistence	1 or on 0 or off

Property	Description	Value
ccx-features	CCX Features	0 or optimized 1 or full 2 or off
certpath	Used to change the path of the certificate store	string
def-adhoc-channel	Indicates the channel to be used for an ad hoc connection if the active profile has a Radio Mode value of Ad Hoc	integer
dfs-channels	Indicates support (or lack of support) for 5 GHz (802.11a) channels where DFS is required	0 or off 1 or on 2 or optimized
frag	Frag Threshold – If packet size (in bytes) exceeds this threshold, then the packet is fragmented.	Any integer in the range of 256 to 2346.
pmk-caching	Indicates the type of PMK caching to use with a WPA2 encryption type.	0 = standard 1 = opmk Note: Cannot enter values of <i>standard</i> or <i>pmk</i> ; only 0 or 1.
roam-delta	Roam delta – The signal strength (RSSI) of the new AP has to be <i><roam-delta></i> (in dBm) better than the current AP before the client attempts to move to the new AP.	5,10,15,20,25,30,35
roam-period	Roam period – The amount of time a radio collects RSSI scan data (after association or a roam scan) before it considers roaming to a different access point.	5,10,15,20,25,30,35,40,45,50,55,60
roam-trigger	Roam trigger – The signal strength (RSSI) (in dBm) at which the radio scans for an access point with a better signal strength.	50,55,60,65,70,75,80,85,90
rts	The packet size above which RST/CTS is required on link	0-2347
rx-diversity	Method of handling antenna diversity when receiving data from the access point	main aux start_main start_aux
scan-dfs-time	Indicates the dwell (listen) time when passively scanning on a DFS channel	20-500 (ms)
tx-diversity	Method of handling antenna diversity when transmitting data to the AP	main – Use main antenna only aux – Use auxiliary antenna only on – Use diversity (Default)
tx-max	Maximum transmission power	integer
wmm	Enables WMM	0 or off 1 or on
ttls-inner-method	Indicates the authentication method that is used within the secure tunnel created by EAP-TTLS	auto mschapv2 mschap pap chap

Property	Description	Value
		eap_mschapv2
date-check	Validates certificates against the system date and time	0 or off 1 or on
fips	Turns FIPS compatibility on	0 or off 1 or on
probe-delay	The number of seconds before the next scan	2-120 (s)
ignore-null-ssid	If enabled, the radio won't connect to the first available open AP if the SSID is blank	0 or disable 1 or enable

Profile

Manage profiles for the radio.

disable

Used to disable the Wi-Fi operation. With Wi-Fi operation disabled, the sdc_cli is still functional but has no radio activity until an **enable** is entered.

The following are profile subcommands.

Subcommand	Description	Usage Example
add	Add a new profile.	sdc_cli profile <profile name> add
delete	Delete the profile.	sdc_cli profile <profile name> delete
	Note: You cannot delete the current profile. Also, there must be at least one profile which means that you cannot delete the last remaining profile.	
list	Lists available profiles.	sdc_cli profile list
rename	Renames an already-created profile.	sdc_cli profile <old name> rename <new name>
set	Sets the available profile variables.	sdc_cli profile <profile name> set <option> <value>

Profile Set - Options

Options for **set** are:

- **authtype** – Authentication type.

Available parameters:

- open
- shared
- eap

- **bitrate** – Maximum bitrate.

Available parameters:

- 0-Auto, 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54

- **cacert** – Sets the certificate file. If <location of certificate file> field left blank, it will erase current certificate path.

sdc_cli profile <profile name> set cacert <location of certificate file>

- **clientname** – Name to report to Cisco APs. If <client name> field left blank, it will erase current client name.

sdcli profile <profile name> set clientname <client name>

- **eaptype** – Set the EAP type.

Available parameters:

- | | |
|---------------|------------|
| - none | - peap-gtc |
| - leap | - eap-tls |
| - eap-fast | - eap-ttls |
| - peap-mschap | - peap-tls |

- **pacpassword** – Sets the password to the PAC file.

sdcli profile <profile name> set pacpassword <password of PAC file>

- **usercert** – Sets the user certificate file. If <name of certificate file> field is left blank, it will erase current certificate path.

sdcli profile <profile name> set usercert <name of certificate file>

- **usercert_password** – Sets the password for the user certificate.

sdcli profile <profile name> set usercert <name of certificate file>

- **mode** – Set the radio's mode.

Available parameters:

- | | |
|-------|---------|
| - B | - BGN |
| - BG | - GN |
| - G | - AN |
| - A | - ABGN |
| - ABG | - BGAN |
| - BGA | - adhoc |

- **pacfilename** – Set the name of the PAC file.

sdcli profile <profile name> set pacfilename <pac file>

- **password** – Sets the password for authentication via EAP, LEAP, etc. If <password> field left blank, it will erase current password.

sdcli profile <profile name> set password <password>

- **powersave** – Sets the power save mode. Available parameters:

off max fast

- **psk** – Sets the PSK of the profile.

sdcli profile <profile name> set psk <psk>

- **ssid** – Sets the SSID of the profile. If <ssid> field left blank, it will erase current ssid.

sdcli profile <profile name> set ssid <ssid>

- **txpower** – Adjusts the transmission power. Available parameters:

- | | |
|---------|------|
| - 0-Max | - 20 |
| - 1 | - 30 |
| - 5 | - 50 |
| - 10 | |

- **user** – Set the username for authentication via EAP, LEAP, etc.


```
sdcli profile <profile name> set user <user name>
```

Note: For information on configuring an outer (anonymous) user identity, see [Configuring an Anonymous Identity](#).

- **wep** – WEP key for the profile.
 - **Set** – Sets the WEP key for the profile.


```
sdcli profile <profile name> set wep <wep key> <index>
```
- **rm** – Clears the WEP key for the profile.


```
sdcli profile <profile name> set wep rm <'all' or 1-4>
```
- **wep type** – Sets the WEP type. Available parameters:

– off	– cckm-tkip
– on	– cckm-aes
– auto	– wpa-psk-aes
– psk	– wpa-aes
– tkip	– wpa2-psk-tkip
– wpa2-psk	
- **auto-profile** – Enable/Disables auto profile for the current profile.
- **show** – Shows a specific property of a profile.


```
sdcli profile <profile name> show <property name>
```
- **activate** – Sets a profile as the profile to use for the radio.


```
sdcli profile <profile name> activate
```
- **delete** – Deletes a profile. WARNING: Does not confirm before deletion.


```
sdcli profile <profile name> delete
```

Configuring an Anonymous Identity

An anonymous identity is configured via the user field in the network profile but it is also connected with the Auth Server type configuration (since the Auth Server type impacts the type of outer identity – anonymous or real – that is used by default for different EAP types). Table xx provides the applicable default outer identities.

Table 1: Default Outer Identity

	Auth Server Type 1	Auth Server Type 2
EAP-FAST	FAST-xxxxxxxxxx	Real identity
	Note: xxxxxxxxxxxx is the radio's 12-digit hexadecimal MAC address	
PEAP-MSCHAP	Real identity	Real identity
PEAP-GTC	Real identity	Real identity
PEAP-TLS	Real identity	Real identity
EAP-TTLS	anonSUMMIT	anonSUMMIT

Note: For EAP-FAST the Auth Server Type setting also affects the PAC provisioning method allowed.

Auth Server Type 1 – Allows both authenticated and unauthenticated PAC provisioning
Auth Server Type 2 – Allows authenticated PAC provisioning

Note: EAP-TLS and LEAP do not support anonymous identity.

To configure an outer identity that is different than the default, type it in the username field using a semicolon to separate the real identity from the outer (anonymous) identity. For example:

```
# sdc_cli profile xxxx set user "user1;anonLAIRD"
```

The real identity is *user1* and the outer identity is *anonLAIRD*.

If you enter the real user name followed by a semicolon but to not enter an outer identity, the real identity is used for the outer identity. This method can be used to override the outer identity when an anonymous identity is used by default. For example:

```
# sdc_cli profile xxxx set user "user1;"
```

The command above results in *user1* being used for both the outer and the real identity.

Scan

Performs a scan and generates a list of available wireless networks.

Scan

Status

Shows the current active profile and associated profile information.

Status

Stop Using

Use this command to stop using the previously set 'using' for profile commands.

stop_using

Using

Uses the specified profile for all the subsequent commands until the *stop_using* command is entered.

using <profile name>

Version

Displays the versions of the wireless components.

version

LINUX SPECIFIC CLI COMMANDS

The following CLI commands only apply to the Linux version (and not the Windows version):

- **iface**

iface

Note: The *iface* command only applies to the Laird WB45NBT.

- **set** – Sets properties in the e/n/l file.

```
sdc_cli iface <property> <interface> <value>
```

The following are options for *set*:

- **auto** – Interface auto-starts at boot.
`sdc_cli iface set auto <interfaceName> <on/off>`
- **dhcp** –Set dhcp method.
`sdc_cli iface set dhcp <interfaceName> <on/off>`
- **address** – Set ip address of interface if not using the dhcp method.
`sdc_cli iface set address <interfaceName> <XXX.XXX.XXX.XXX>`
- **gateway** – Set the gateway address of an interface if not using the dhcp method.
`sdc_cli iface set gateway <interfaceName> <XXX.XXX.XXX.XXX>`
- **netmask** – Set the dns address of an interface if not using the dhcp method.
`sdc_cli iface set nameserver <interfaceName> <XXX.XXX.XXX.XXX>`

Note: The <XXX.XXX.XXX.XXX> can be either one or two address separated by a space.

- **broadcast** – Set the broadcast address of an interface if not using the dhcp method.
`sdc_cli iface set broadcast <interfaceName> <XXX.XXX.XXX.XXX>`
 - **state** – Enable or disable the interface in the e/n/i file
`sdc_cli iface set state <interfaceName> <on/off>`
 - **bridge_ports** – Set the interfaces two use with the bridging interface.
`sdc_cli iface set bridge_ports <interfaceName> <interfaceName>
<interfaceName>`
- **show** – Show the interfaces from the e/n/i file.
`sdc_cli iface show`
 - **add** – Add an interface to the e/n/i/ file.
`sdc_cli iface add <interfaceName>`
 - **remove** – Sets properties in the e/n/i file.
`sdc_cli iface remove <interfaceName>`
 - **init** – Sets properties in the e/n/i file.
`sdc_cli iface init`
 - **Command History** – Press the up arrow key at the command prompt to cycle through the most recent commands entered at the prompt.

EXAMPLE LINUX COMMANDS AND OUTPUT

Input Examples

The CLI allows for several different methods of input. This section shows terminal commands (prefaced by the shell prompt, #, and where relevant the cli prompt, sdc#) and an example of the returned data.

Single command from command line

```
# sdc_cli version
CLI: 3.5.0.3
SDK: 3.5.0.2
Hardware Chipset: 45
Driver: 3.5.0.0
Firmware: ar6003 hw 2.1.1 fw 3.4.0.0081. api 4
SupPLICant: sdc supp v3.4.7.18
Build: Laird Linux wb45n-laird_fips-3.4.1.103
#
```

Interactive

```
# sdc_cli
sdc# version
CLI: 3.5.0.3
SDK: 3.5.0.2
Hardware Chipset: 45
Driver: Driver not loaded. Unable to check driver version.
Firmware: Driver not loaded. Unable to check firmware version.
SupPLICant: sdc supp v3.4.7.18
Build: Laird Linux wb45n-laird_fips-3.4.1.103
sdc#
```

Using a pipe

```
# echo version | sdc_cli
CLI: 3.5.0.3
SDK: 3.5.0.2
Hardware Chipset: 45
Driver: 3.5.0.0
Firmware: ar6003 hw 2.1.1 fw 3.4.0.0081. api 4
SupPLICant: sdc supp v3.4.7.18
Build: Laird Linux wb45n-laird_fips-3.4.1.103
```

File redirection

```
# cat > version.txt
version<ctrl-d>
# sdc_cli < version.txt
CLI: 3.5.0.3
SDK: 3.5.0.2
Hardware Chipset: 45
Driver: 3.5.0.0
Firmware: ar6003 hw 2.1.1 fw 3.4.0.0081. api 4
SupPLICant: sdc supp v3.4.7.18
Build: Laird Linux wb45n-laird_fips-3.4.1.103
```

Scan Output

The scan command does not interrupt the radio from doing an internal scan. It retries the scan several times, but occasionally aborts due to duration. Retrying the scan after a few seconds usually permits the scan to succeed.

The output contains SSID, BSSID MAC, channel, RSSI, bssType, and security in descending order of priority.

```
#sdc_cli scan
BSS 0:
SSID: fipsk
BSSID: c8:f9:f9:29:15:60
Channel: 1
RSSI: -57 dBm
bssType: Infrastructure
Security: wpa2-psk-aes

BSS 1
SSID: mic_test
BSSID: 00:14:1b:58:e8:a0
Channel: 1
RSSI: -74 dBm
bssType: Infrastructure
Security: wpa2-psk-aes wpa-psk-tkip

BSS 2
SSID: dual
BSSID: 34:a8:4e:e7:e0:e0
Channel: 1
RSSI: -65 dBm
bssType: Infrastructure
Security: wpa2-aes cckm-aes

BSS 3
SSID: WLAN_PBN
BSSID: a0:cf:5b:cb:36:c0
Channel: 1
RSSI: -49 dBm
bssType: Infrastructure
Security: wpa2-aes

BSS 4
SSID: pskhex
BSSID: 34:a8:4e:e7:e0:e1
Channel: 1
RSSI: -64 dBm
bssType: Infrastructure
Security: wpa2-psk-aes wpa-psk-aes wpa2-psk-tkip wpa-psk-tkip
```

Profile Examples

To set up an open authentication profile for an AP with SSID openap:

```
# cat > open.txt
profile open add
profile open set SSID openap
profile open activate<ctrl-d>
# cat open.txt | sdc_cli
```

Note: The following examples assume interactive input at the sdc# prompt.

To set up a profile with 40 bit WEP key encryption using key #2:

```
profile prof2 add
profile prof2 set ssid AP2
profile prof2 set weptype on
profile prof2 set wep 01234 2
```

To set up a profile with 128 bit WEP key encryption using key #2:

```
profile prof3 add
profile prof3 set ssid AP3
profile prof3 set weptype on
profile prof3 set wep 0123456789012 2
```

To set up a profile with LEAP:

```
profile prof4 add
profile prof4 set ssid AP4
profile prof4 set weptype auto
profile prof4 set eaptype leap
profile prof4 set user username
profile prof4 set password userpassword
```

To set up a profile with WPA1 pre-shared key:

```
profile prof7 add
profile prof7 set ssid AP7
profile prof7 set weptype wpa_psk
profile prof7 set psk oklahoma
```

To set up a profile with WPA1, LEAP, and TKIP:

```
profile prof8 add
profile prof8 set ssid AP8
profile prof8 set weptype wpa-tkip
profile prof8 set eaptype leap
profile prof8 set user username
profile prof8 set password userpassword
```

To set up a profile with WPA2 pre-shared key:

```
profile prof9 add
profile prof9 set ssid AP9
profile prof9 set weptype wpa2-psk-aes
profile prof9 set psk Oklahoma
```

To set up a profile with WPA2, AES, and LEAP:

```
profile prof10 add
profile prof10 set ssid AP10
profile prof10 set weptype wpa2-aes
profile prof10 set eaptype leap
profile prof10 set user username
profile prof10 set password userpassword
```

To set up a profile with WPA1, pre-shared key, and AES:

```
profile prof11 add
profile prof11 set ssid AP11
profile prof11 set weptype wpa-psk-aes
profile prof11 set psk Oklahoma
```

To set up a profile with WPA1, LEAP, and AES:

```
profile prof12 add
profile prof12 set ssid AP12
profile prof12 set weptype wpa-aes
profile prof12 set eaptype leap
profile prof12 set user username
profile prof12 set password userpassword
```

To set up a profile with WPA2 and pre-shared key:

```
profile prof13 add
profile prof13 set ssid AP13
profile prof13 set weptype wpa2-psk
profile prof13 set psk Oklahoma
```

To set up a profile with WPA2 and LEAP:

```
profile prof14 add
profile prof14 set ssid wfa14
profile prof14 set weptype wpa2
profile prof14 set eaptype leap
profile prof14 set user username
profile prof14 set password userpassword
```

To set up a profile with WPA1 and TTLS:

```
profile prof15 add
profile prof15 set ssid AP15
profile prof15 set weptype wpa-aes
profile prof15 set eaptype eap-ttls
profile prof15 set user username
profile prof15 set password userpassword
profile prof15 set cacert cacertname.cer
```

To set up a profile with WPA2, EAP-TLS, and AES:

```
profile prof16 add
profile prof16 set ssid AP16
profile prof16 set weptype wpa2-aes
profile prof16 set eaptype eap-tls
profile prof16 set user username
profile prof16 set password usercert username.pfx
profile prof16 set cacert cacertname.cer
```

To set up a profile with 802.1X with EAP-TTLS:

```
profile prof17 add
profile prof17 set ssid AP17
profile prof17 set weptype auto
profile prof17 set eaptype eap-ttls
profile prof17 set user username
profile prof17 set password userpassword
profile prof17 set cacert cacertname.cer
```

To set up a profile with WPA1, TTLS, and TKIP:

```
profile prof18 add
profile prof18 set ssid AP18
profile prof18 set weptype wpa-tkip
profile prof18 set eaptype eap-ttls
profile prof18 set user username
profile prof18 set password userpassword
profile prof18 set cacert cacertname.cer
```

To set up a profile with WPA2, TTLS, and AES:

```
profile prof19 add
profile prof19 set ssid AP19
profile prof19 set weptype wpa2-aes
profile prof19 set eaptype eap-ttls
profile prof19 set user username
profile prof19 set password userpassword
profile prof19 set cacert cacertname.cer
```


WB40 AND WB45-SPECIFIC INFORMATION

Some commands and settings differ in their behavior and implementation on the WB40 and WB45 wireless bridges modules. The following sections cover WB4X-specific commands, as well as notes on the differing behavior of various settings.

WB4X CLI Commands

- [Activate Global Settings](#)
- [Activate Global Settings](#)

Activate Global Settings

Note: This is a LINUX only feature. It does not apply to the Windows operating system.

This command activates the global setting and re-establishes the configured global settings to the radio after a wireless stop/shutdown.

activate_global

WB4X Settings

The following settings are implemented differently on the WB40 and WB45 modules.

Global Settings

Setting	Description	Notes
a-channel-set	Sets the exact frequency channel in the A channel set.	Channels vary based on selected regulatory domain. On WB4X, this sets the exact channel rather than the channel set. Channels for the United States (FCC) for example include: 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128.