

WiLink™ 8 Solutions WiLink8 - wlconf

ABSTRACT

- The wlconf tool is used to configure the WLAN device with specific behavior arguments.
- The main usage is to apply specific parameter file to be passed over to the chip.
- Main target for the wlconf.bin file is to set initial PHY system parameters based on the ini file as well as to set the HT mode system configuration parameter **BUT** it can also be **very** useful for debugging and changing miscellaneous system settings (such as allowed TX block-ack TIDs, interrupt pacing, BA window size etc)

More information is available in the README:

https://github.com/TI-OpenLink/18xx-ti-utils/blob/mc_internal/wlconf/README

Contents

1	WiLink8 wlconf Quick Startup	2
2	First Time System Configuration Script	2
3	Feature Configuration Script	2
4	WiLink8 wlconf Basic Commands	2
5	WiLink8 wlconf Usage.....	3
6	WiLink8 wlconf - Configuration Files	4
7	WiLink8 wlconf Parameters	4

1 WiLink8 wlconf Quick Startup

- The system configuration file will be loaded to system at startup from default location:
/lib/firmware/ti-connectivity/wl18xx-conf.bin
- Configuration file is binary, Wlconf tool provides the parsing capability to modify default configuration and modify system parameters.
- Wlconf tool located at */usr/sbin/wlconf*
- A default wlconf configuration file is located in */usr/sbin/wlconf/wl18xx-conf-default.bin*
- The standard INI files (PHY system configuration) are located at */usr/sbin/wlconf/official_inis*

2 First Time System Configuration Script

Starting from release R8.6, there is an easy configuration script for the WLAN device according to user inputs named *configure-device.sh*.

The script will be installed, as part of the release, in the target filesystem in */usr/sbin/wlconf*

Once you boot your board for the first time you are required to use this script to configure the chip appropriately.

Running this script with the argument of the device in use (ie wl1801, wl1805, wl1807, wl1831, wl1835 or wl1837) will generate the correct **wl18xx-conf.bin** file.

Usage: *configure-device.sh* <option>

Options:

Version	Show Version
Help	Show Help
Dump	Save wl18xx-conf.bin dump to wl18xx-conf-dump.txt
<empty>	Configuration mode

NOTE: *configure-device.sh* set all the required TI module wlconf PHY configurations. In case non TI module is used the script configures number of antenna's only and the customer required to set the RF limitation parameters in order to pass regulatory certification.

3 Feature Configuration Script

Starting from R8.6 there is a new system configuration script to enable Zigbee Coexistence/Time sync features. The script will be installed, as part of the release, in the target filesystem in */usr/share/wl18xx*

Running this script with the argument (zigbee, sync) will generate the correct **wl18xx-conf.bin** file.

Usage: *wlconf-toggle-set.sh* <bin path> <feature> <mode>

4 Wilink8 wlconf Basic Commands

Run the commands from the wlconf folder: *cd /usr/sbin/wlconf*

Example 1: Printing a dump file of the binary_name file into a text file:

```
./wlconf -i $binary_name --get > wl18xx-conf-dump.txt
```

Example 2: Set system to default file and plotting system settings:

```
cp wl18xx-conf-default.bin /lib/firmware/ti-connectivity/wl18xx-conf.bin
./wlconf -i /lib/firmware/ti-connectivity/wl18xx-conf.bin --get
```

Example 3: To set MIMO on a mimo board:

```
./wlconf -i /lib/firmware/ti-connectivity/wl18xx-conf.bin -s wl18xx.ht.mode=0x0 -o \
/lib/firmware/ti-connectivity/wl18xx-conf.bin
./wlconf -i /lib/firmware/ti-connectivity/wl18xx-conf.bin -s \
wl18xx.phy.number_of_assembled_ant2_4=0x02 -o /lib/firmware/ti-connectivity/wl18xx-conf.bin
```

Example 4: Set active configuration with a specific INI file:

(for this example, assume a modified ini file located in /usr/share/wl18xx)

```
cp /usr/share/wl18xx/my_ini_file.ini /usr/sbin/wlconf/official_inis/my_ini_file.ini
./wlconf -o /lib/firmware/ti-connectivity/wl18xx-conf.bin -I \
/usr/sbin/wlconf/official_inis/my_ini_file.ini
```

Example 5:

Searching for specific parameter after making a txt file can be done by using "grep" command, for example:

```
grep wl18xx.phy.number_of_assembled_ant5 wl18xx-conf-dump.txt
```

Example 6:

Adding parameters from "example.conf" into the wl18xx-conf.bin.

```
./wlconf -i /lib/firmware/ti-connectivity/wl18xx-conf.bin \
-o /lib/firmware/ti-connectivity/wl18xx-conf.bin -C /usr/bin/wlconf/example.conf
```

Example 7:

For debug only - Preventing the driver from running recoveries.

```
./wlconf -i /lib/firmware/ti-connectivity/wl18xx-conf.bin \
-o /lib/firmware/ti-connectivity/wl18xx-conf.bin -s core.recovery.no_recovery=1
```

Example 8:

Get the value of ht_mode inside wl18xx struct from the default binary configuration file (wl18xx-conf-default.bin):

```
./wlconf -g wl18xx.ht.mode
```

5 WiLink8 wlconf Usage

wlconf [OPTIONS] [COMMANDS]

OPTIONS

-S, --source-struct	use the structure specified in a C header file
-b, --binary-struct	specify the binary file where the structure is defined
-i, --input-config	location of the input binary configuration file
-o, --output-config	location of the output binary configuration file
-X, --ignore-checksum	ignore file checksum error detection

COMMANDS

-D, --create-default	create default configuration bin file (wl18xx-conf- default.bin)
-g, --get	get the value of the specified element (element[.element...]) or print the entire tree if no element is specified
-s, --set	set the value of the specified element (element[.element...])
-G, --generate-struct	generate the binary structure file from the specified source file
-C, --parse-text-conf	parse the specified text config and set the values accordingly
-I, --parse-ini	parse the specified INI file and set the values accordingly in the output binary configuration file
-p, --print-struct	print out the structure
-h, --help	print this help

6 WiLink8 wlconf - Configuration Files

- You should run `wlconf` under its metadata folder, for example:

```
# cd /usr/sbin/wlconf
# wlconf -help
```

- Make sure the content of the following folders is by the latest TI release (<http://www.ti.com/tool/WILINK8-WIFI-NLCP>):

- `/usr/sbin/wlconf`
- `/usr/sbin/wlconf/official_inis/`
- `/usr/share/wl18xx`

- Mapping of `ht_mode`:

```
MIMO: use wl18xx.ht.mode=0
SISO40: use wl18xx.ht.mode=1 (default)
SISO20: use wl18xx.ht.mode=2
```

- Location of configuration bin file: `/lib/firmware/ti-connectivity/wl18xx-conf.bin`

NOTE: If file does not exist driver will fall-back to default values (SISO40).

7 WiLink8 wlconf Parameters

The below table details a few useful parameters:

Parameter Name	Meaning (/units)	Values	Comments
<code>core.rx.rts_threshold</code>	RTS threshold (bytes)	0-2346	
<code>core.rx.irq_pkt_threshold</code>	RX Data interrupt pacing counter	0-xxxxx	0 = disabled
<code>core.rx.irq_timeout</code>	RX Data interrupt pacing timeout (µsec)	0-xxxxx	
<code>core.tx.tx_compl_threshold</code>	TX Complete interrupt pacing counter	0-xxxxx	0 = disabled
<code>core.tx.tx_compl_timeout</code>	TX Complete interrupt pacing timeout (µsec)	0-xxxxx	
<code>core.ht.rx_ba_win_size</code>	RX Block-ack window size (frames)	0-xxxxx	
<code>core.ht.tx_ba_tid_bitmap</code>	TX allowed TID for block ACK (bitmap)	0-0x3f	each bit represents a TID

For more parameters, the conf file is generated from the following header file, comments included.
<https://git.ti.com/wilink8-wlan/18xx-ti-utils/blobs/master/wlconf/conf.h>.

For additional information please refer to the .INI guide ([SWRU422](#)).

Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
August 2015	*	Initial Release

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com