



## MP User Guide

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Realtek Wan driver supports Mass Production functions. Customers can utilize these functions to do EMI test and other simple TX and RX test. Command APIs can be used to get and set I/O control to WLAN driver. Be sure to enable Wlan interface before using MP

This MP tool is running on FreeROTS environment.

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## 1 Introduction

The RTL8195a driver supports driver based Mass Production functions. Customers can utilize these functions to do EMI test and other simple TX and RX test. Under RTL8195a turnkey, we command APIs can be used to get and set I/O control to WLAN driver. The MP functions will only operate after the WLAN interface is opened.

This MP tool is running on FreeRTOS environment.

## 2 MP library

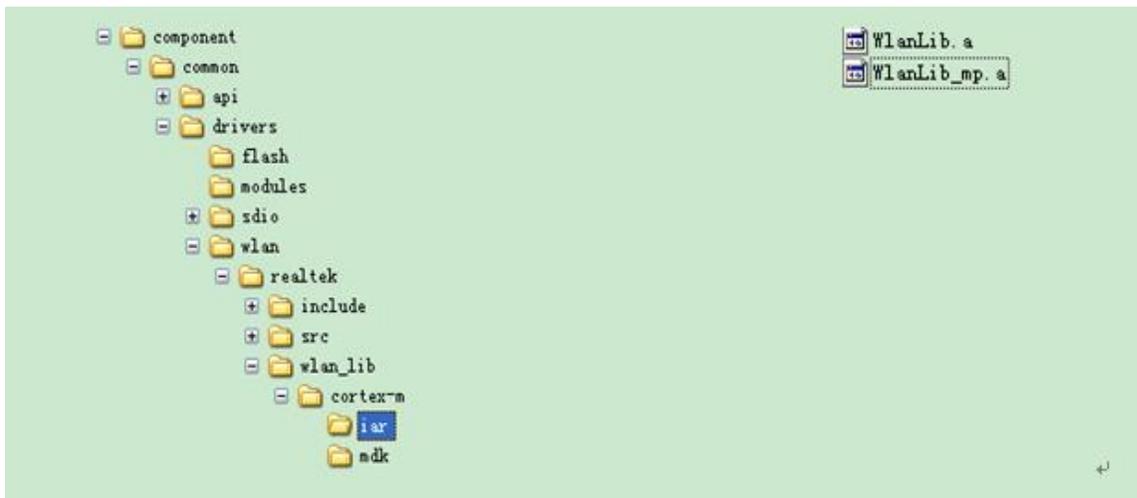
### 2.1 SDK revision v2.x series

Normal driver and MP driver use separate libraries. WlanLib.a is for normal driver, and WlanLib\_mp.a is for MP mode driver. **To initiate driver in MP mode, WlanLib\_mp.a must be used. To activate MP mode driver:**

Step 1: Please Set **CONFIG\_INTERACTIVE\_MODE to 1**, CONFIG\_START\_STA and CONFIG\_START\_AP to 0 in main.c file.

```
//Config in main.c
#define CONFIG_INIT_NET          1
#define CONFIG_START_STA        0
#define CONFIG_START_AP         0
#define CONFIG_INTERACTIVE_MODE 1
```

Step 2: Save WlanLib.a with another name such as WlanLib-normal.a for backup and rename WlanLib-mp.a with WlanLib.a. Rebuild the code.



## 2.2 SDK revision v3.x series

Normal driver and MP driver use separate libraries. lib\_wlan.a is for normal driver, and lib\_wlan\_mp.a is for MP mode driver. **To initiate driver in MP mode, lib\_wlan\_mp.a must be used. To activate MP mode driver:**

Step 1: back up normal driver in

```
component\soc\realtek\8195a\misc\bsp\lib\common\IAR\lib_wlan.a
```

Step 2:

Rename component\soc\realtek\8195a\misc\bsp\lib\common\IAR\lib\_wlan\_mp.a with component\soc\realtek\8195a\misc\bsp\lib\common\IAR\lib\_wlan.a

Step 3:

Rebuild project.

## 3 Command Usage

### 3.1 Start MP mode

```
iwpriv mp_start
```

After executing this command, WLAN driver enters MP mode and stops transmitting and receiving any packets. All connection with other stations will be broken. Beacon transmitting is also stopped. If the original state is client mode, the roaming will be stopped.

### 3.2 Stop MP mode

```
iwpriv mp_stop
```

After executing this command, WLAN driver will stop transmitting and receiving packets initialized by other commands. It will not return to normal operation mode. System should close the WLAN interface and open again to get WLAN work normally.

### 3.3 Set Tx rate

```
iwpriv mp_rate rate
```

rate: sets the rate of Tx packets (i.e., 2 for 1M, 4 for 2M, 11 for 5.5M, ..., 108 for 54M, 128 for MCS0, 129 for MCS1, ..., 142 for MCS15)

Set the data rate of continuous transmitting.

### 3.4 Set operational channel

```
iwpriv mp_channel channel
```

channel: sets the channel to send and receive packets

Set the operational channel of transmitting and receiving packets.

### 3.5 Set operational bandwidth

```
iwpriv mp_bandwidth 40M=40m,shortGI=sgi
```

40m: sets the operational bandwidth, 1 for 40M mode, 0 for 20M mode

sgi: sets guard interval of transmitting MCS packet, 1 for short GI, 0 for long GI

Set the operational bandwidth for transmitting and receiving packets. Set the guard interval for transmitting MCS packets. If the parameters are not given, the default action is set bandwidth to 20M mode and long GI to transmitting packets.

### 3.6 Set Tx power

```
iwpriv mp_txpower patha=x,pathb=y
```

x: sets Tx power level for path A

y: sets Tx power level for path B

Set the transmitting power level of path A and path B. If the parameters are not given, the driver will set Tx power according to the flash setting.

### 3.7 Set antenna for Tx

```
iwpriv mp_ant_tx ant
```

ant: sets the operational antenna for Tx, a for antenna A, b for antenna B, ab for antenna A and B

Set the operational antenna for Tx on the target board.

### 3.8 Set antenna for Rx

```
iwpriv mp_ant_rx ant
```

ant: sets the operational antenna for Rx, a for antenna A, b for antenna B, ab for antenna A and B

Set the operational antenna for Rx on the target board.

### 3.9 Start air Rx mode

```
iwpriv mp_arx start/stop/phy
```

start: starts to accumulate Rx packets

stop: stops counts and show the statistics

phy: shows the count of RF physical received packets, CRC error, false alarm.

This command is for air receiving test. Use start command to accumulate the received packets. Use stop command to stop counting and show the statistics of correct packets and CRC-error packets. Use phy command to show the count of RF physical received packets, CRC error and false alarm.

### 3.10 Start continuous Tx mode

```
iwpriv mp_ctx count=n,background,stop,pkt,cs,stone
```

t: sets the number of seconds to send packets

n:	sets the number of packets to send
background:	sends packets in background mode
stop:	stops the background sending
pkt:	sends packet tx, i.e., not sent by hardware
cs:	sends carrier suppression
stone:	sends single tone

This command is for continuous transmitting test. Use time command to assign the time to send packets. Use count command to assign the number of packets to send. If both of time and count are not specified, the sending function will continue infinitely. It can be stopped when any key is pressed (should be specifically implemented in other platform) while background command is not specified. If cs is specified, the sending signal will be a carrier suppression signal. Use stone command to send single tone signal for frequency testing. If stone is specified, the sending signal will be single tone and not a distinguishable packet any more. Use background command to tell driver to send packets in background. The command line control will return and packet sending is continuous. It can be stopped by stop command. By default, packets will be sent by hardware for shorter duty cycle. If pkt is specified, packets will be sent by software.

### 3.11 Query air Rx statistics

```
iwpriv mp_query
```

This command is for packet counting. Under packet transmitting, use this command to get the number of packets being transmitted. Under receiving, use this command to get the statistics of correct packets and CRC-error packets.

### 3.12 Reset air Tx/Rx statistics

```
iwpriv mp_reset_stats
```

This command is for reset the packet counts. Under packet transmitting, use this command to reset the number of packets after the transmitted or receiving, use this command to reset the statistics of correct packets and CRC-error packets.

## 4 Example Command

### 4.1 Continuous Tx testing

(Execute the following commands after WLAN interface is normally opened)

<b>iwpriv mp_start</b>	enter MP mode
<b>iwpriv mp_channel 1</b>	set channel to 1 . 2, 3, 4~11 etc.
<b>iwpriv mp_bandwidth 40M=0,shortGI=0</b>	set 20M mode and long GI
<b>iwpriv mp_ant_tx a</b>	select antenna A for operation
<b>iwpriv mp_txpower patha=44,pathb=44</b>	set path A and path B Tx power level
<b>iwpriv mp_rate 108</b>	set OFDM data rate to 54Mbps,ex: CCK 1M = 2, CCK 5.5M = 11, KK, OFDM54M = 108 N Mode: MCS0 = 128, MCS1 = 129.....etc.
<b>iwpriv mp_ctx background</b>	start continuous Tx
<b>iwpriv mp_ctx stop</b>	stop continuous Tx
<b>iwpriv mp_stop</b>	exit MP mode

### 4.2 Continuous Packet Tx testing

(Execute the following commands after WLAN interface is normally opened)

<b>iwpriv mp_start</b>	enter MP mode
<b>iwpriv mp_channel 1</b>	set channel to 1 . 2, 3, 4~11 etc.
<b>iwpriv mp_bandwidth 40M=0,shortGI=0</b>	set 20M mode and long GI
<b>iwpriv mp_ant_tx a</b>	select antenna A for operation
<b>iwpriv mp_txpower patha=44,pathb=44</b>	set path A and path B Tx power level
<b>iwpriv mp_rate 108</b>	set OFDM data rate to 54Mbps,ex: CCK 1M = 2, CCK 5.5M = 11, KK, OFDM54M = 108 N Mode: MCS0 = 128, MCS1 = 129.....etc.
<b>iwpriv mp_ctx background,pkt</b>	start packet continuous Tx
<b>iwpriv mp_ctx stop</b>	stop continuous Tx

### 4.3 Count Packet Tx testing

(Execute the following commands after WLAN interface is normally opened)

<b>iwpriv mp_start</b>	enter MP mode
<b>iwpriv mp_channel 1</b>	set channel to 1 . 2, 3, 4~11 etc.
<b>iwpriv mp_bandwidth 40M=0,shortGI=0</b>	set 20M mode and long GI
<b>iwpriv mp_ant_tx a</b>	select antenna A for operation
<b>iwpriv mp_txpower patha=44,pathb=44</b>	set path A and path B Tx power level
<b>iwpriv mp_rate 108</b>	set OFDM data rate to 54Mbps,ex:
CCK 1M = 2, CCK 5.5M = 11, KK, OFDM54M = 108 N Mode: MCS0 = 128, MCS1 = 129.....etc.	
<b>iwpriv mp_ctx count=%d,pkt</b>	Number of packets start packet Tx
<b>iwpriv mp_ctx stop</b>	stop continuous Tx
<b>iwpriv mp_stop</b>	exit MP mode

## 4.4 Carrier suppression testing

(Execute the following commands after WLAN interface is normally opened)

<b>iwpriv mp_start</b>	enter MP mode
<b>iwpriv mp_channel 1</b>	set channel to 1 . 2, 3, 4~11 etc.
<b>iwpriv mp_bandwidth 40M=0,shortGI=0</b>	set 20M mode and long GI
<b>iwpriv mp_ant_tx a</b>	select antenna A for operation
<b>iwpriv mp_txpower patha=44,pathb=44</b>	set path A and path B Tx power level
<b>iwpriv mp_rate 108</b>	set OFDM data rate to 54Mbps,ex:
CCK 1M = 2, CCK 5.5M = 11, KK, OFDM54M = 108 N Mode: MCS0 = 128, MCS1 = 129.....etc.	
<b>iwpriv mp_ctx background,cs</b>	start sending carrier suppression signal
<b>iwpriv mp_ctx stop</b>	stop continuous Tx
<b>iwpriv mp_stop</b>	exit MP mode

## 4.5 Single Tone Tx testing

(Execute the following commands after WLAN interface is normally opened)

<b>iwpriv mp_start</b>	enter MP mode
<b>iwpriv mp_channel 1</b>	set channel to 1 . 2, 3, 4~11 etc.
<b>iwpriv mp_bandwidth 40M=0,shortGI=0</b>	set 20M mode and long GI
<b>iwpriv mp_ant_tx a</b>	select antenna A for operation
<b>iwpriv mp_txpower patha=44,pathb=44</b>	set path A and path B Tx power level
<b>iwpriv mp_rate 108</b>	set OFDM data rate to 54Mbps,ex:
CCK 1M = 2, CCK 5.5M = 11, KK, OFDM54M = 108 N Mode: MCS0 = 128, MCS1 = 129.....etc.	

<b>iwpriv mp_ctx background,stone</b>	start sending single tone signal
<b>iwpriv mp_ctx stop</b>	stop sending single tone signal
<b>iwpriv mp_stop</b>	exit MP mode

## 4.6 Air Rx testing

(Execute the following commands after WLAN interface is normally opened)

<b>iwpriv mp_start</b>	enter MP mode
<b>iwpriv mp_bandwidth 40M=1,shortGI=0</b>	set 40M mode and long GI
<b>iwpriv mp_channel 6</b>	set channel to 6
<b>iwpriv mp_ant_rx ab</b>	select all 2 antennas for operation
<b>iwpriv mp_arx start</b>	start air Rx
<b>iwpriv mp_query</b>	get the statistics
<b>iwpriv mp_arx stop</b>	stop air Rx and show the statistics
<b>iwpriv mp_stop</b>	exit MP mode

## 5 Data read/write example

### 5.1 SDK revision v2.x series

#### 5.1.1 Get efuse

```
iwpriv efuse_get rmap,0a,16
```

0a: sets the number of efuse offset (hex)

16: sets the number of byte counts (dec)

This command is for start of the efuse's logic address 0x0a offset and set the number of bytes for read the efuse content.

#### 5.1.2 Set efuse

```
iwpriv efuse_set wmap,0a,00e04c871234
```

0a: sets the number of efuse offset (hex)

00e04c871234: data bytes (hex) , **Max: 16 bytes**

This command is for a offset address for write 6 bytes data "0x00,0xe0,0x4c,0x87,0x12,0x34" to the 0x0a start of the efuse logic address.

## 5.2 SDK revision v3.x series

### 5.2.1 Get config

```
iwpriv config_get rmap,11a,16
```

11a: sets the number of config offset (hex)

16: sets the number of byte counts (dec)

This command is for start of the config's logic address 0x0a offset and set the number of bytes for read the config content.

### 5.2.2 Set config

```
iwpriv config_set wmap,11a,00e04c871234
```

11a: sets the number of config offset (hex)

00e04c871234: data bytes (hex) , **Max: 16 bytes**

This command is for a offset address for write 6 bytes data "0x00,0xe0,0x4c,0x87,0x12,0x34" to the 0x0a start of the config logic address.

## 6 Crystal Calibration

### 6.1 Set Crystal Calibration

```
iwpriv mp_phypara xcap=26
```

26: sets the value of crystal calibration (dec)

This command is for crystal calibration.

#### Crystal Calibration Example

(Execute the following commands after WLAN interface is normally opened)

```
iwpriv mp_start          enter MP mode
iwpriv mp_channel 1      set channel to 1 . 2, 3, 4~11 etc.
iwpriv mp_bandwidth 40M=0,shortGI=0  set 20M mode and long GI
iwpriv mp_ant_tx a       select antenna A for operation
iwpriv mp_txpower patha=44  set path A Tx power level
iwpriv mp_phypara xcap=32  set crystal calibration value
iwpriv mp_ctx background,stone  start sending single tone signal
iwpriv mp_phypara xcap=26  set crystal calibration value
iwpriv mp_phypara xcap=24  set crystal calibration value
( Crystal Calibration Success! Find Crystal Index = 24 ! )
iwpriv mp_ctx stop       stop sending single tone signal
iwpriv mp_stop           exit MP mode
```