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Version information

Version	Date	Author
0.5	2018/06/02	Terence Hsieh
0.4	2018/02/04	Terence Hsieh
0.3	2014/05/29	Terence Hsieh
0.2	2014/05/05	Terence Hsieh
0.1	2013/10/18	Richie Shih

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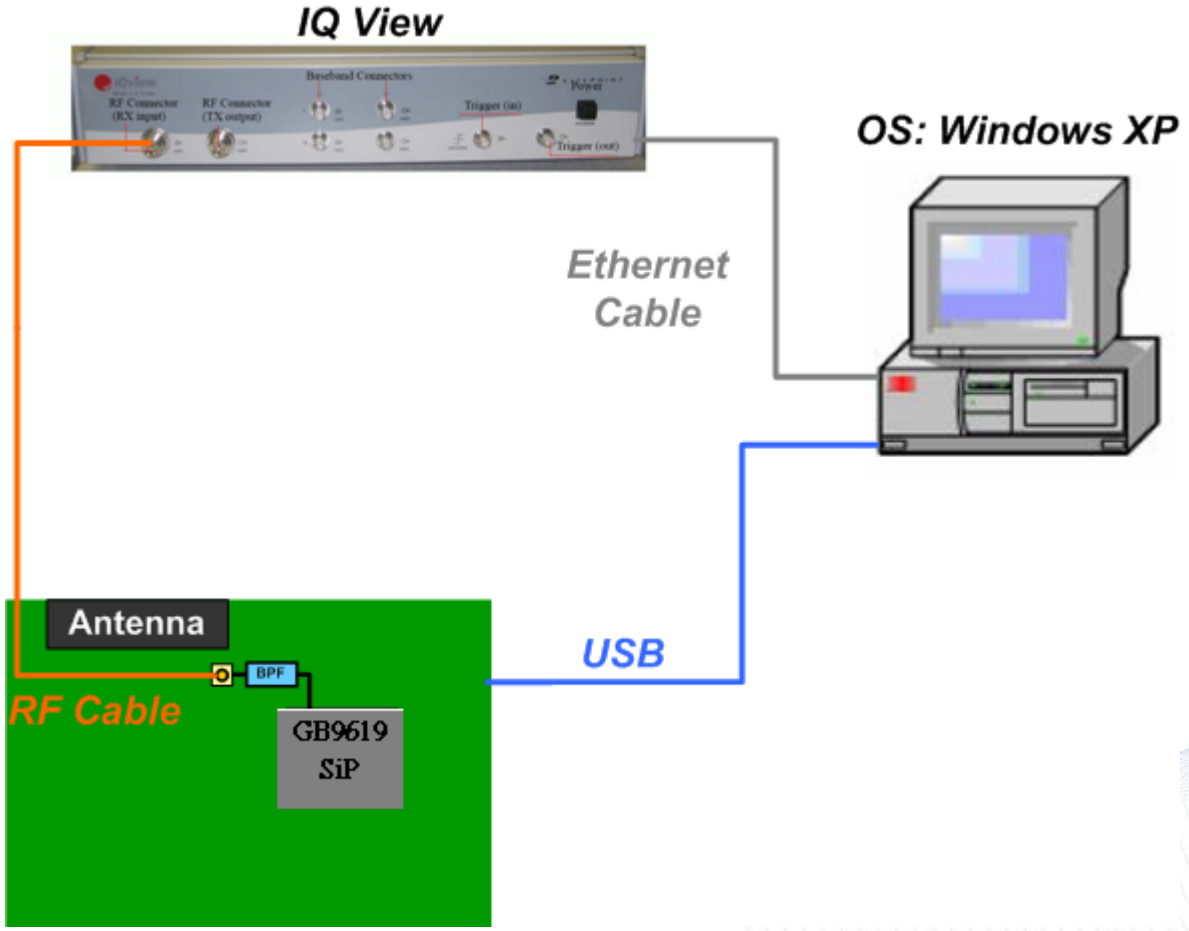
Continuous Modulation/Single-Tone Tx Configuration

The following procedure describes how to analyze the 802.11a/b/g/n Tx Packet using IQview and WL commands.



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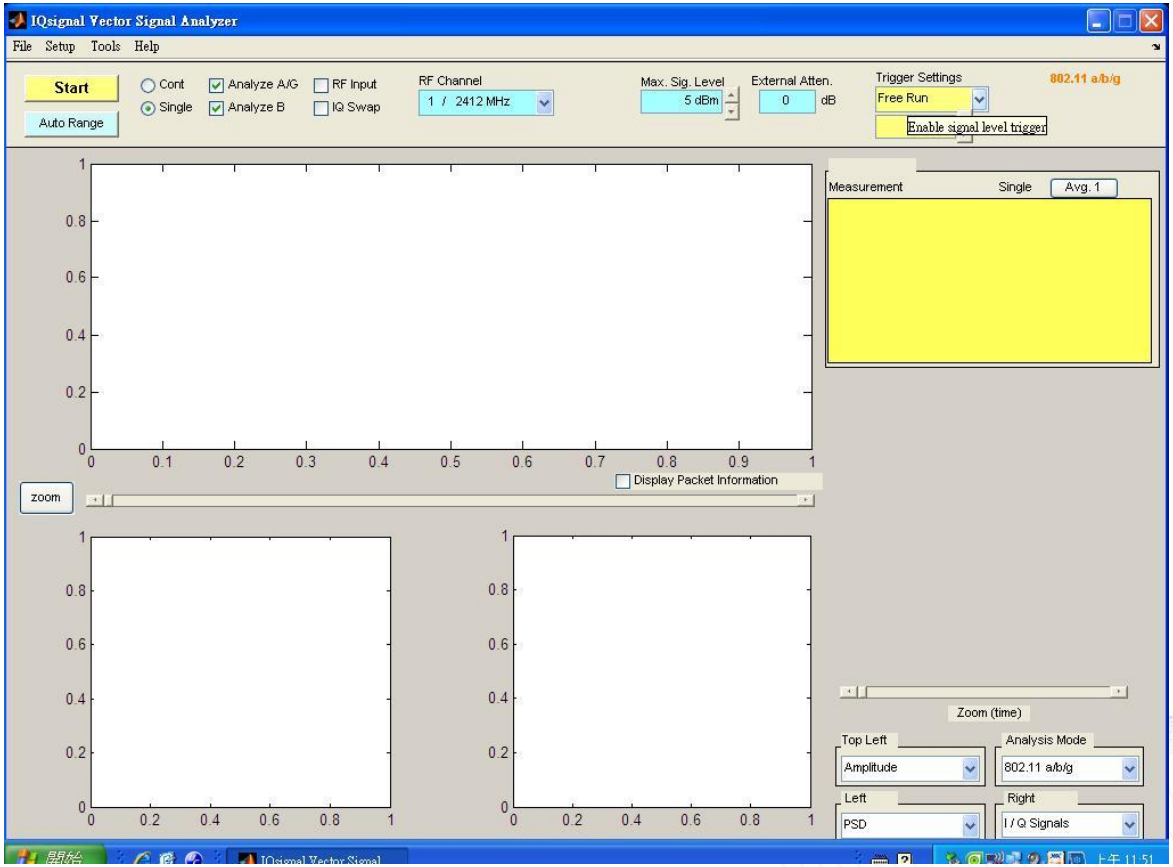
Set up the IQview for Modulation/Single-Tone Tx

Step1. Execute IQview.exe 

and the GUI shows below.



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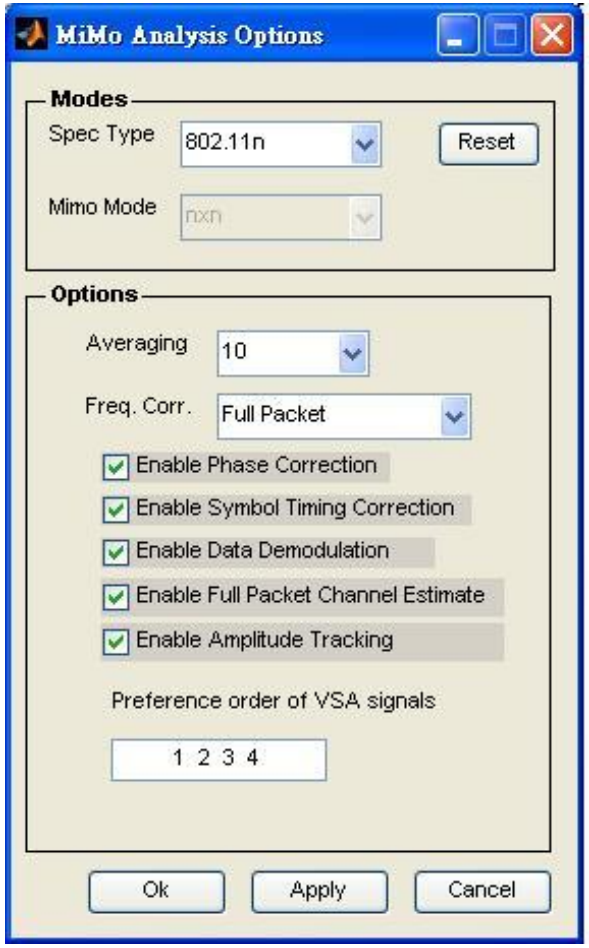
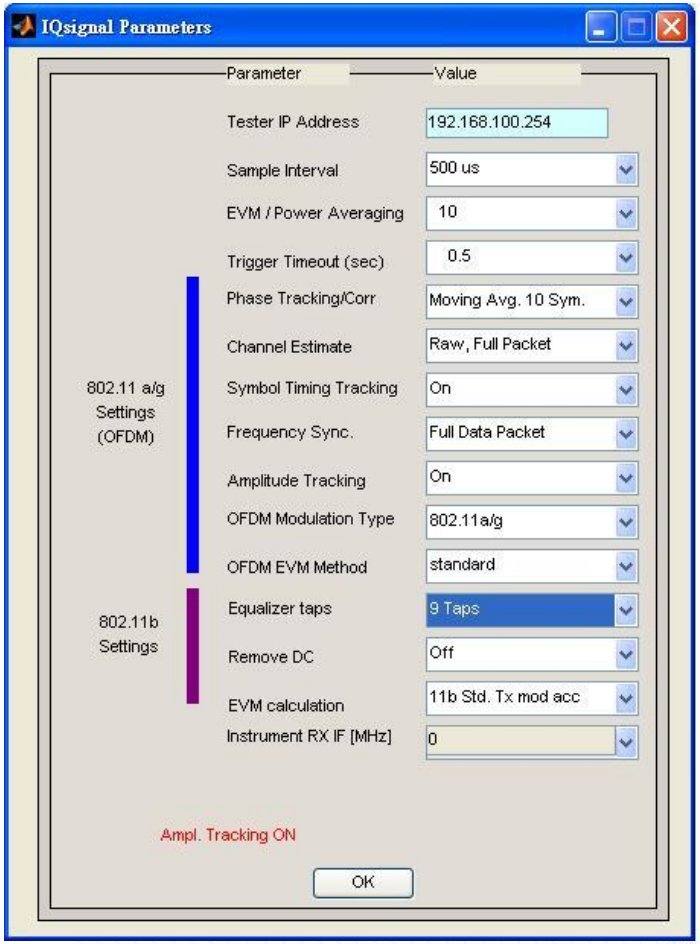
Set up the IQview for Modulation/Single-Tone Tx

For IQMIMO (For analyze 802.11a/g/n mode)



For IQsignal (For analyze 802.11a/b/g mode)



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Set up Wi-Fi in your device for RF Test

If Wi-Fi driver is built a kernel module(bcmdhd.ko):

1) Pull BT_REG_ON to Low
2) insmod /system/lib/modules/bcmdhd.ko iface_name=wlan0 firmware_path=/etc/firmware/fw_bcmdhd_**mfg**.bin nvram_path=/etc/firmware/nvram.txt
3) ifconfig wlan0 up
4) wl ver ➔ Check firmware name and should include (**WLTEST**) string

If Wi-Fi driver is built in kernel

1) Pull BT_REG_ON to Low
2) echo /system/etc/firmware/fw_bcmdhd_**mfg.**bin > /sys/module/**bcmdhd**/parameters/firmware_path
3) ifconfig wlan0 up
4) wl ver ➔ Check firmware name and should include (**WLTEST**) string

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Continuous Modulation Tx – 802.11a

```
wl down
wl mpc 0
wl country ALL
wl band a
wl up
wl 5g_rate -r 54 -b 20
wl channel 36
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

Modulation	5g_rate
BPSK	6
BPSK	9
QPSK	12
QPSK	18
16-QAM	24
16-QAM	36
64-QAM	48
64-QAM	54

Band	channel
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161, 165

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Continuous Modulation Tx – 802.11b

```
wl down
wl mpc 0
wl country ALL
wl band b
wl up
wl 2g_rate -r 11 -b 20
wl channel 11
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

Modulation	2g_rate
DBPSK	1
DQPSK	2
DQPSK	5.5
DQPSK	11

Band	channel
2.4GHz (2400~2483)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

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Continuous Modulation Tx – 802.11g

```
wl down
wl mpc 0
wl country ALL
wl band b
wl up
wl 2g_rate -r 54 -b 20
wl channel 11
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

Modulation	2g_rate
BPSK	6
BPSK	9
QPSK	12
QPSK	18
16-QAM	24
16-QAM	36
64-QAM	48
64-QAM	54

Band	channel
2.4GHz (2400~2483)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

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Continuous Modulation Tx – 802.11n(HT20)

```
wl down
wl mpc 0
wl country ALL
wl band b
wl up
wl 2g_rate -h 7 -b 20
wl chanspec 11/20
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

a=5GHz, b=2.4GHz

Modulation	2g_rate/5g_rate (MCS)
BPSK	0
QPSK	1
QPSK	2
16-QAM	3
16-QAM	4
64-QAM	5
64-QAM	6
64-QAM	7

Band	chanspec
2.4GHz (2400~2483)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161, 165

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Continuous Modulation Tx – 802.11n(HT40 5GHz)

```
wl down
wl mpc 0
wl country ALL
wl band a
wl mimo_txbw 4
wl up
wl 5g_rate -h 7 -b 40
wl chanspec 36/40
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

Modulation	5g_rate (MCS)
BPSK	0
QPSK	1
QPSK	2
16-QAM	3
16-QAM	4
64-QAM	5
64-QAM	6
64-QAM	7

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161

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Continuous Modulation Tx – 802.11ac(HT20 5GHz)

```
wl down
wl mpc 0
wl country ALL
wl band a
wl up
wl 5g_rate -v 8 -s 1 -b 20
wl chanspec 36/20
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

Modulation	5g_rate (MCS)
BPSK	0
QPSK	1
QPSK	2
16-QAM	3
16-QAM	4
64-QAM	5
64-QAM	6
64-QAM	7
256-QAM	8

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161, 165

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Continuous Modulation Tx – 802.11ac(HT40 5GHz)

```
wl down
wl mpc 0
wl country ALL
wl band a
wl up
wl 5g_rate -v 9 -s 1 -b 40
wl chanspec 36/40
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

Modulation	5g_rate (MCS)
BPSK	0
QPSK	1
QPSK	2
16-QAM	3
16-QAM	4
64-QAM	5
64-QAM	6
64-QAM	7
256-QAM	8
256-QAM	9

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161

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Continuous Modulation Tx – 802.11ac(HT80 5GHz)

```
wl down
wl mpc 0
wl country ALL
wl band a
wl up
wl 5g_rate -v 9 -s 1 -b 80
wl chanspec 36/80
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1
wl phy_txpwrctrl 1
wl txpwr1 -1
wl pkteng_start 00:90:4c:14:43:19 tx 100 1000 0
```

Modulation	5g_rate (MCS)
BPSK	0
QPSK	1
QPSK	2
16-QAM	3
16-QAM	4
64-QAM	5
64-QAM	6
64-QAM	7
256-QAM	8
256-QAM	9

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161

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Continuous Single-Tone Tx

wl down

wl up

wl band a ← a=5GHz, b=2.4GHz

wl out

wl fqacurcy 1

Band	fqacurcy
2.4GHz (2400~2483)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161, 165

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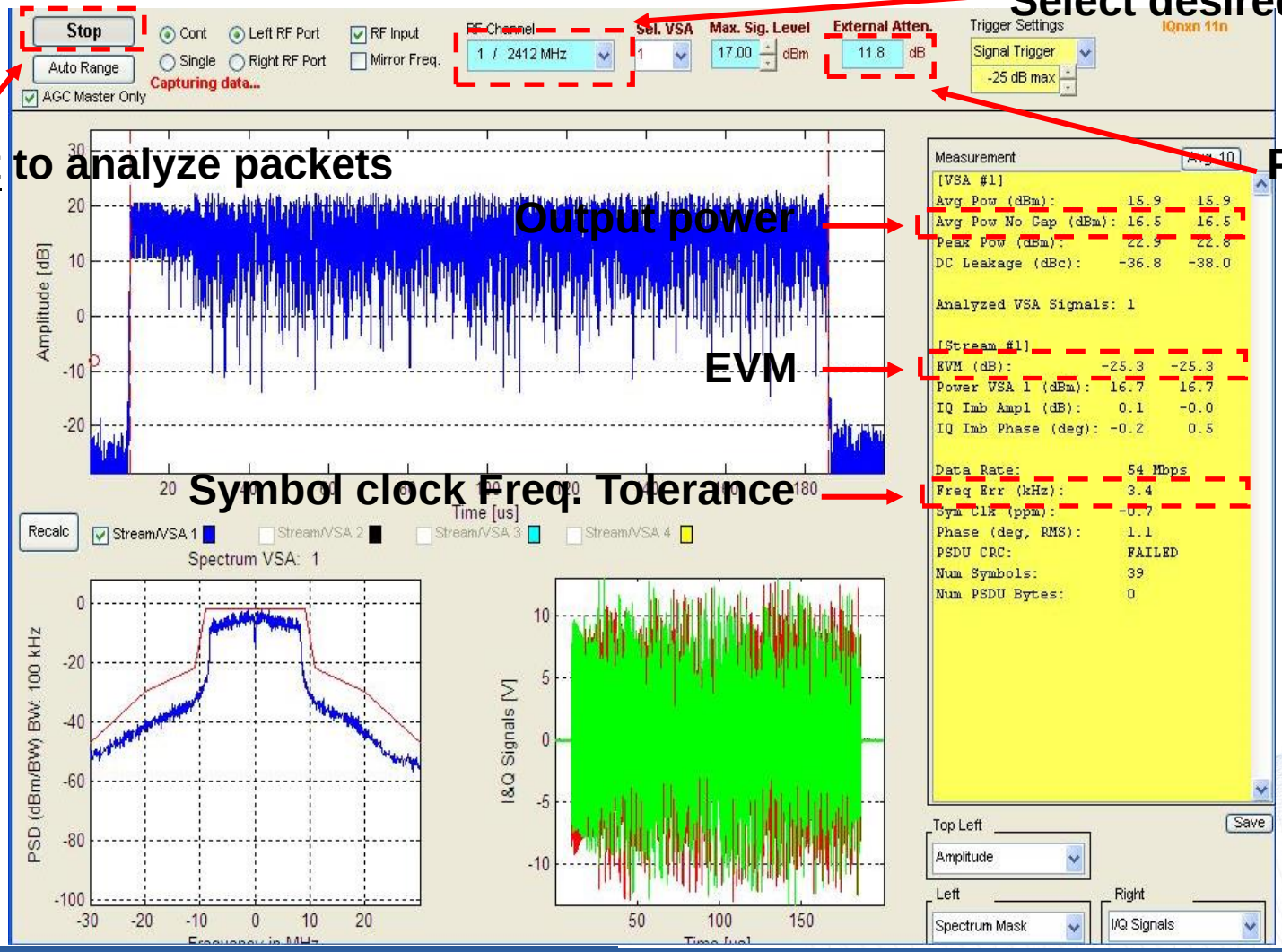
Continuous Modulation/Single-Tone Tx

Select desired channel

Click Start to analyze packets

Path loss



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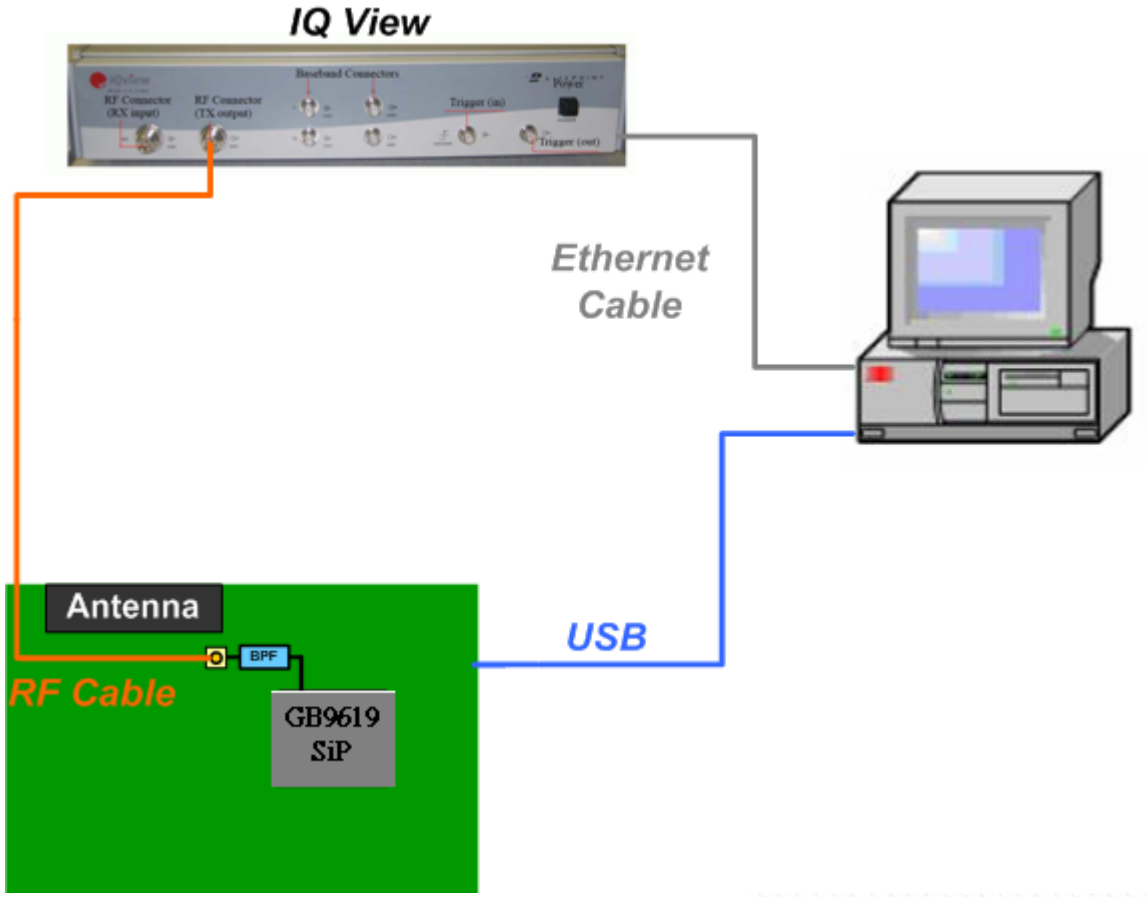
Continuous Rx Configuration

The following procedure shows the setup for OFDM 54 Mbps signal sequence with a 1000 packet count and describes how to calculate the RX Packet Error Rate using IQview and WL commands.



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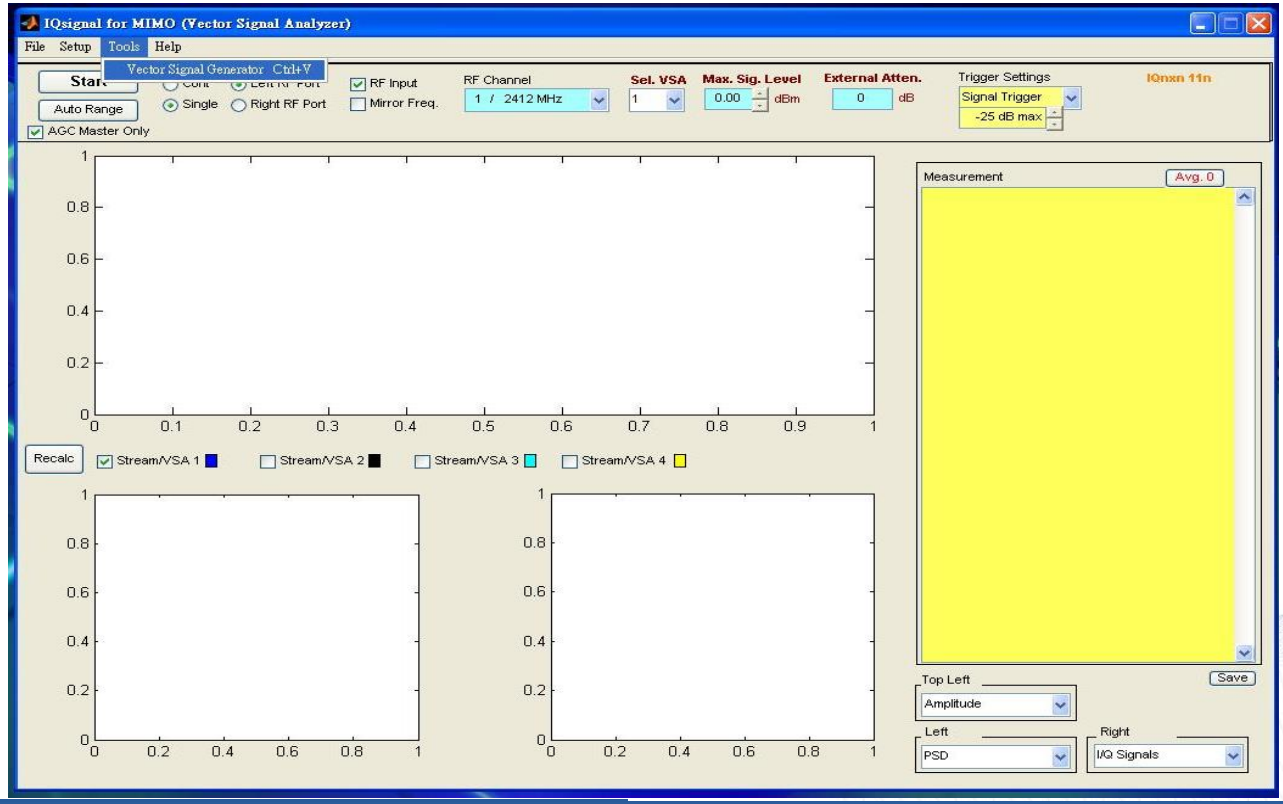
Set up the IQview VSG function for Continuous Rx

Step1. Execute IQview.exe 

and the GUI shows below.

Step2. From the GUI, select Tools and then click Vector Signal Generator.



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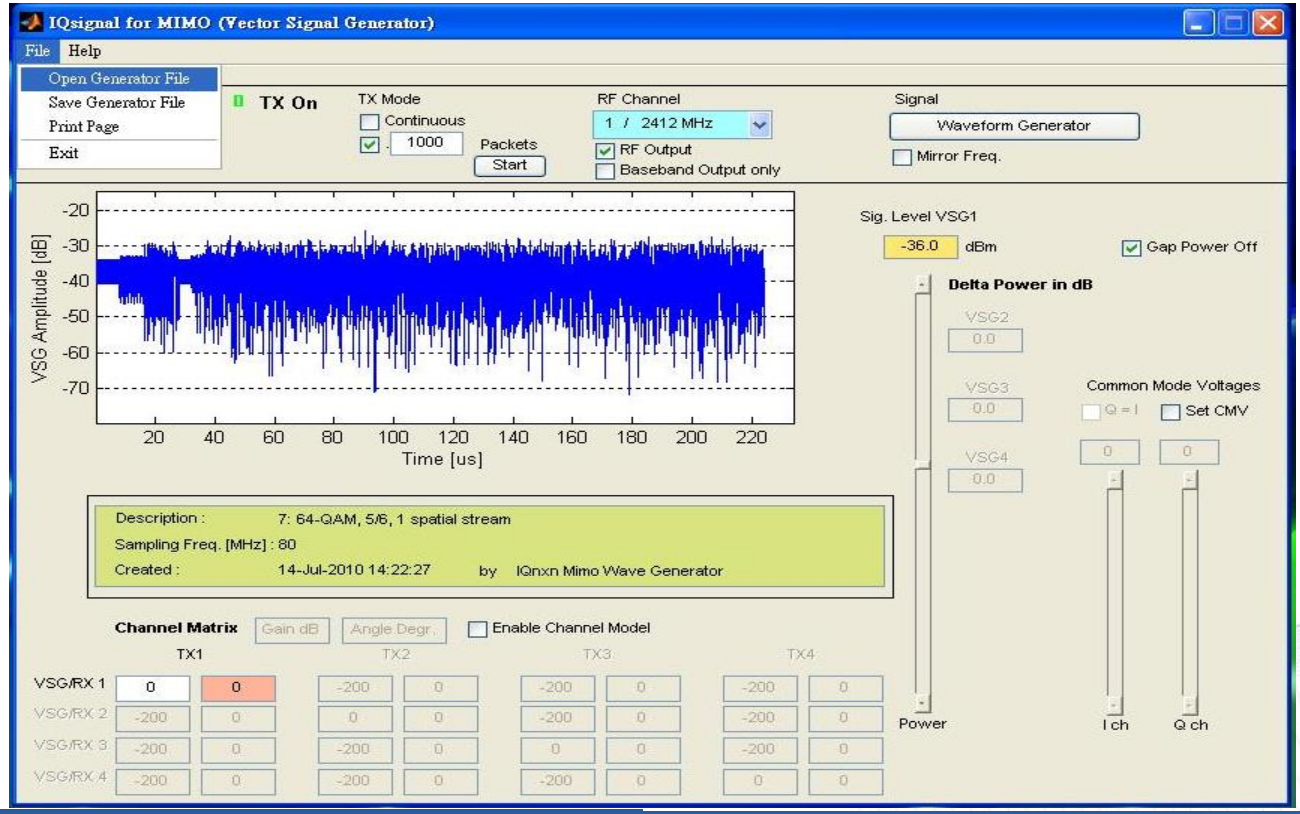
Set up the IQview VSG function for Continuous Rx

Step3. The Vector Signal Generator GUI shows below.

Step4. Select File and click Open Generator File to load the wave-form.



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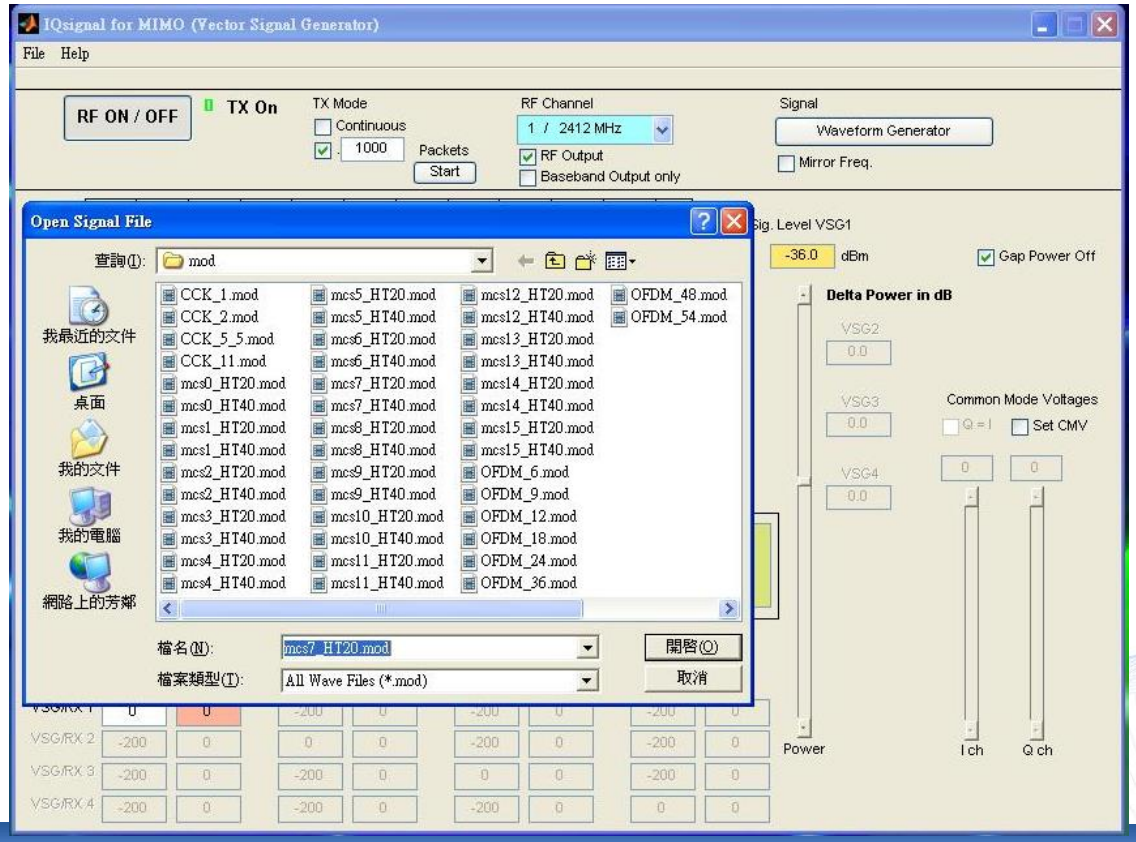
Set up the IQview VSG function for Continuous Rx

Step5. From the Open Signal File, select the desired wave-form file and click Open.

For test 802.11b(11M), please select CCK_11.mod
802.11a/g(54M), please select OFDM_54.mod
802.11n(mcs7), please select mcs7_HT20.mod (IQ MIMO)



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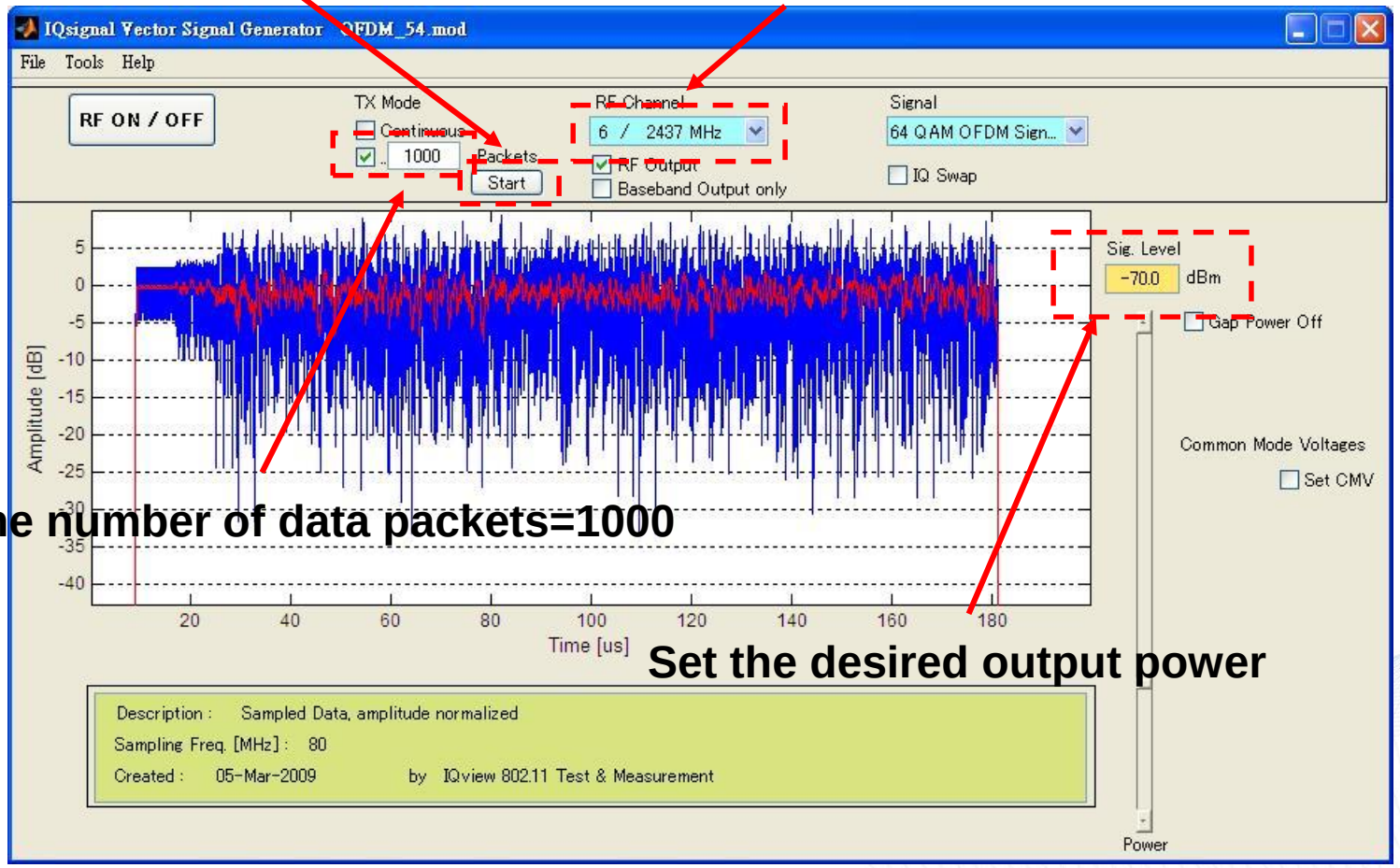
Set up the IQview VSG function for Continuous Rx

Click Start to sent packets

Select desired channel



Set the number of data packets=1000

Set the desired output power

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Continuous Rx – 802.11a/b/g, 802.11n(HT20)

wl down
wl band auto
wl mpc 0
wl country ALL
wl channel 7
wl bi 65535
wl up
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1

Band	channel
2.4GHz (2400~2483)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161, 165

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Continuous Rx – 802.11n(HT40 5GHz)

wl down
wl band auto
wl mpc 0
wl country ALL
wl mimo_txbw 4
wl chanspec 36/40
wl bi 65535
wl up
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161

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Continuous Rx – 802.11ac(HT20)

wl down
wl band auto
wl mpc 0
wl country ALL
wl mimo_txbw 4
wl chanspec 36/20
wl bi 65535
wl up
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161, 165

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Continuous Rx – 802.11ac(HT40)

wl down
wl band auto
wl mpc 0
wl country ALL
wl mimo_txbw 4
wl chanspec 36/40
wl bi 65535
wl up
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161

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Continuous Rx – 802.11ac(HT80)

wl down
wl band auto
wl mpc 0
wl country ALL
wl mimo_txbw 4
wl chanspec 36/80
wl bi 65535
wl up
wl phy_watchdog 0
wl scansuppress 1
wl phy_forcecal 1

Band	chanspec
5GHz Band 1(5150~5250)	36, 40, 44, 48
5GHz Band 2(5250~5350)	52, 56, 60, 64
5GHz Band 3(5475~5725)	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144
5GHz Band 4(5725~5850)	149, 153, 157, 161

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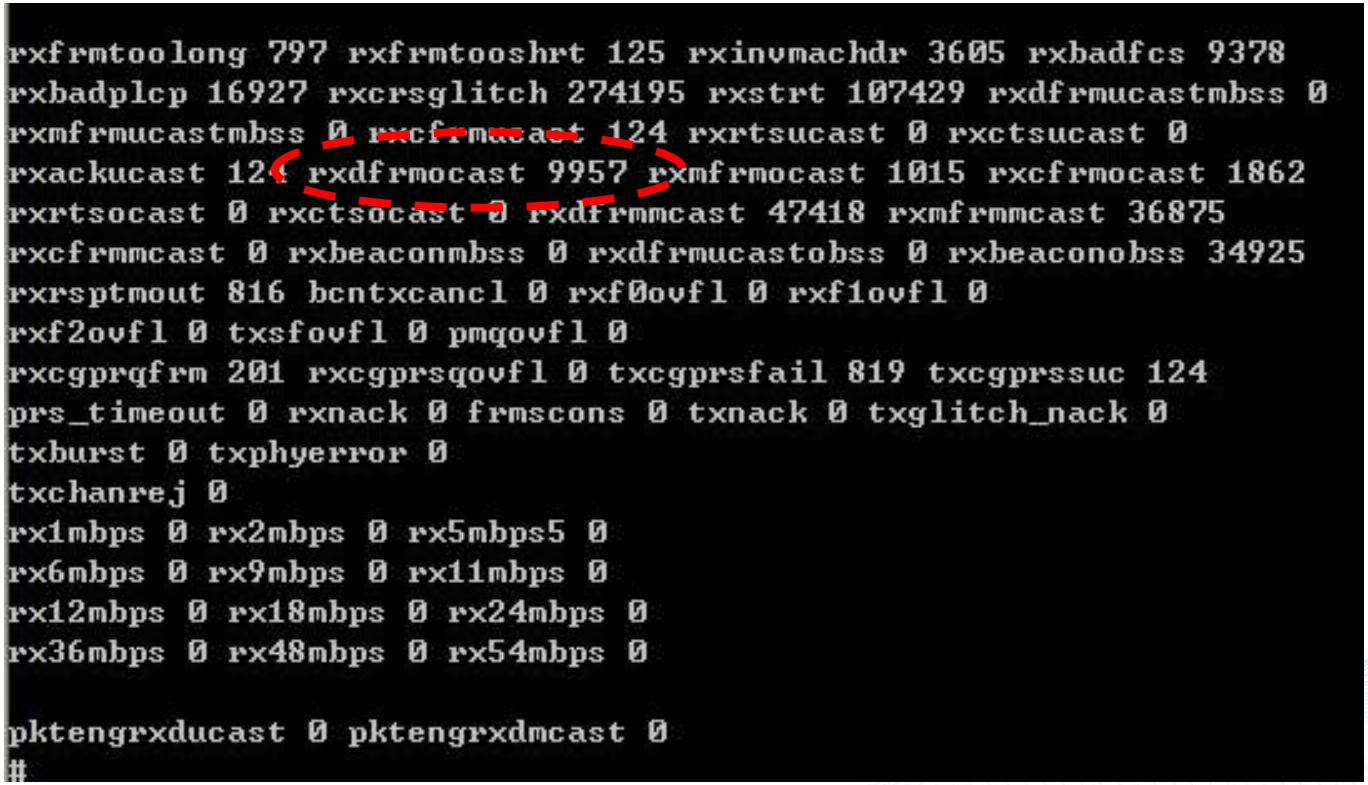
Count on Rx packets

Step1. Enter the ./wl counters command and note the number following the rxdfrmocast (9957).



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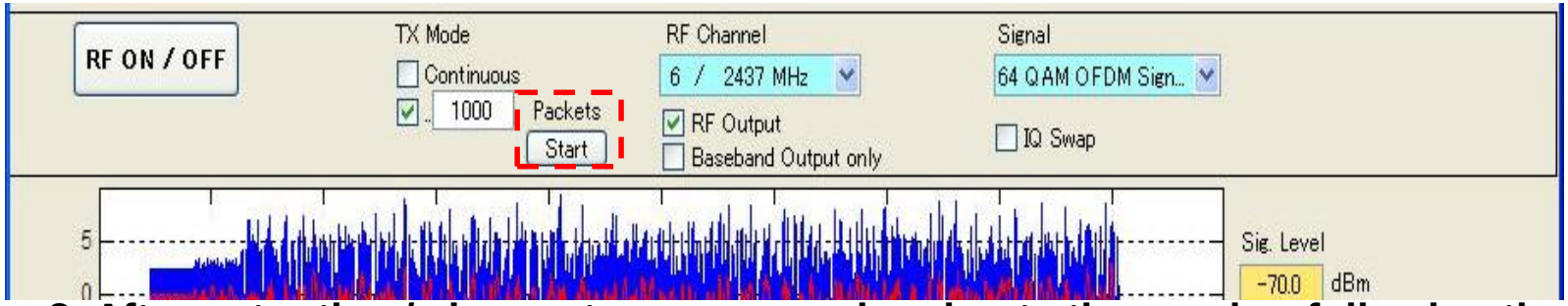
Count on Rx packets

Step2. Click the Start button and then enter the ./wl counters command .



Step3. After enter the ./wl counters command and note the number following the rxdfrmocast (10905).

```
rxfrmtoolong 805 rxfrmtooshrt 125 rxinvmachdr 3622 rxbadfcs 9403
rxbadplcp 16985 rxcrsglitch 279554 rxstrt 108535 rxdfrmucastmbss 0
rxmfrmucastmbss 0 rxcfrmucast 124 rxrtsucast 0 rxctsucast 0
rxackucast 124 rxdfrmocast 10905 rxmfrmocast 1015 rxcfrmocast 1862
rxrtsocast 0 rxctsocast 0 rxdfrmmcast 47418 rxmfrmmcast 37000
rxcfrmmcast 0 rxbeaconmbss 0 rxdfrmucastobss 0 rxbeaconobss 35050
rxrsptmout 816 bcntxcancl 0 rxf0ovfl 0 rxf1ovfl 0
rxf2ovfl 0 txsfovfl 0 pmqovfl 0
rxcgprqfrm 201 rxcgprsqovfl 0 txcgprsfail 819 txcgprssuc 124
prs_timeout 0 rxnack 0 frmscons 0 txnack 0 txglitch_nack 0
txburst 0 txphyerror 0
txchanrej 0
rx1mbps 0 rx2mbps 0 rx5mbps5 0
rx6mbps 0 rx9mbps 0 rx11mbps 0
rx12mbps 0 rx18mbps 0 rx24mbps 0
rx36mbps 0 rx48mbps 0 rx54mbps 0

pktengrxducast 0 pktengrxdmcast 0
#
```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Count on Rx packets

Step4. The RX PER

= (Total lost packets at receiver / Total sent packets from the VSG)*100%

In this example:

Total packets received = 10905-9957=948.

So, the Total lost packets at receiver = 1000-948 = 52.

Thus, the RX PER = 52/1000 = 5.2% for -70dBm, OFDM 54Mbps

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