HUAWEI Module

Mtool User Guide

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About This Document

Revision History

Document Version	Date	Chapter	Descriptions
01	2011-06-15		Creation
02	2012-02-29	All	Revised the scope for modules that Mtool can test.
		11.2.3	Revised the description for [TYPE]
		11.2.13	Revised 11.2.13 [CMD_TYPE]
		11.3.3	Revised the description for [TYPE]
03	2012-07-11	5.8	Added "BODYSAR" for console commands and parameters for UMTS
		5.9	Added "ICCID" for console commands and parameters for UMTS
		7.8	Added "BODYSAR" for examples of console commands for UMTS
		7.9	Added "ICCID" for examples of console commands for UMTS
		11.2.3	Revised the parameter description of [TYPE]
		11.2.9	Revised the parameter [PCUI] to [PORTNAME] and reviesed the parameter description of [PORTNAME]
		11.2.11	Revised the parameter description of [SYSTEM]
		11.2.14	Added the parameter description of [BODYSAR]
		11.2.15	Added the parameter description of [ICCID]

Document Version	Date	Chapter	Descriptions
		11.3.3	Revised the parameter description of [TYPE]
04	2015-01-23	2	Added operations to perform on the Mtool
		3	Updated limitations to use the Mtool
		5	Updated console commands and examples
		6.2	Updated configuration file description
		7	Updated Error Messages
		8	Updated saving of test results
		9	Added FAQ
05	2015-09-09	5.1	Added a note about conf and updated the example of conf
		5.2	Updated the example of imsi
		5.3	Updated the example of imei
		5.6	Updated the example of rssi
		5.6	Added the LTE bands in Table 5-1 and Table 5-2, and a note about Table 5-1
		5.7	Updated the example of sim
		5.9	Updated the example of simlock
		5.11	Updated the parameter description and example of gps
		5.12	Updated the example of iccid
		5.13	Added the console command of cbsar
		6.2	Updated configuration file
		6.2.1	Updated the usage of [SYSTEM]
		6.2.2	Added a note about [TYPE]
		6.2.3	Updated the note about [PORTNAME]
		6.2.14	Added the configuration item of [CBSAR]
		6.3	Updated the Windows operation interface

Contents

1 Purpose

This document describes how to use Huawei module Mtool, including overview of Mtool, commands and parameters of Mtool, examples, and precautions.

This document enables relevant technical engineers to understand the commands of the Mtool and use the Mtool to test Huawei modules.

2 Overview

The Mtool is used to test Huawei modules. The Mtool can test the module's basic information (including the module name, IMEI, IMSI, hardware version and software version) and antenna connectivity that are generated by a signal generator, and save test results.

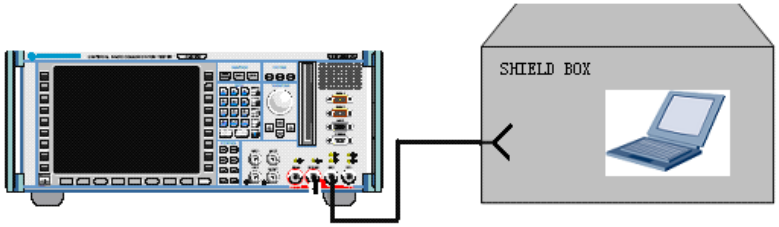
You can perform operations on the Mtool using:

- Console commands
- Windows interface

3 Limitations

Applicable modules:	See Release Notes of the Mtool.
Operating systems:	See Release Notes of the Mtool.
Driver version:	See Release Notes of the Mtool.
Other requirements:	• The driver must be the standard driver provided by Huawei. • The Mtool needs to create result files when it is running. Log in to the Mtool as an administrator. • When the Mtool is running, do not power off or hibernate the operating system or perform operations that interfere with the Mtool. • In command lines and configuration files, do not place parameters in quotation marks (') or double quotation marks ("). • Set the Mtool according to its instructions to ensure proper running of the Mtool. • The Mtool only supports simplified Chinese and English version of the operating system. And the paths where the Mtool is running and the log is saved must contain English characters only.

4 Connection Diagram



NOTE

- The instrument shown in the figure is the CMU200, which can be replaced with any other instruments that can test modules' RF.
- It is recommended that the laptop be placed in a shield box during the test to avoid external signal interference.
- The test scheme applies to near-field coupling tests on module's antenna connectivity.

5 Console Commands and Examples

NOTE

- Optional parameters are presented in [] and mandatory parameters are presented in <>. Parameters are separated by only one space character.
- Parameters are case-insensitive.
- On the console, set the [SYSTEM] and [TYPE] fields in the **config.ini** file correctly. For configuration details, see section 6.2 Configuration File Description.

5.1 conf

Command syntax:	**mtool conf [-fw firmware] [-hw hardware]**
Command function:	Tests and displays module's basic information, including the module name, software version, hardware version, IMEI/MEID and IMSI.
Parameter description:	• **-fw**: Configure this parameter to check the software version of the tested module (default value: null). • **-hw**: Configure this parameter to check the hardware version of the tested module (default value: null).
Example:	

```
D:\mtool>mtool conf

D:\mtool>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-08-28 17:14

Search Dut Port... Pass

CONF CHECK: Pass
 Model : MU736
 HardWare : MD1MU736M
 FirmWare : 12.103.36.00.00
 IMEI : 492100022000114
 IMSI : 460991234567890

Check Dut State Before Exit... Pass
+++++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

Other examples:

mtool conf –fw 11.604.22.99.00

mtool conf –hw MD31TCPU

mtool conf –fw 11.604.22.99.00 –hw MD31TCPU

NOTE

The hardware version is not case sensitive.

5.2 imsi

Command syntax: **mtool imsi**

Command function: Tests and displays the SIM card's IMSI number.

Parameter description: No parameter.

Example:

```
D:\mtool>mtool imsi

D:\mtool>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-08-28 17:14

Search Dut Port... Pass

IMSI CHECK: Pass
 IMSI : 460991234567890

Check Dut State Before Exit... Pass
++++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

5.3 imei

Command syntax: **mtool imei**

Command function: Tests and displays the module's IMEI number.

Parameter description: No parameter.

Example:

```
D:\mtool>mtool imei

D:\mtool>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-08-28 17:10

Search Dut Port... Pass

IMEI CHECK: Pass
 IMEI : 492100022000114

Check Dut State Before Exit... Pass
++++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

NOTE

This command can be executed only in the LTE/UMTS/TD-SCDMA module.

5.4 meid

Command syntax: **mtool meid**

Command function: Tests and displays the module's MEID number.

Parameter description: No parameter

Example:

```
E:\Mtool\DCMTOOL01\Output>mtool meid

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2014-02-27 15:36

Search Dut port... Pass.

MEID CHECK : Pass
 MEID : f2121212000694
Check Dut State Before Exit Pass
++++++++++++++++++++++++  END  ++++++++++++++++++++++++++
```

NOTE

This command can be executed only in the CDMA module.

5.5 esn

Command syntax: **mtool esn**

Command function: Tests and displays the module's ESN number.

Parameter description: No parameter

Example:

```
E:\Mtool\DCMTOOL01\Output>mtool esn

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2014-02-27 15:36

Search Dut port... Pass.

ESN CHECK : Pass
 ESN : 27016107
Check Dut State Before Exit Pass
++++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

NOTE

This command can be executed only in the CDMA module. You must specify either the ESN or MEID for CDMA modules.

5.6 rssi

Command syntax: **mtool rssi <-m mode> <-f frequency> [-g gain] [-pt primary target] [-at aux target] [-w window] [-rt overtime] [-tt test times] [-div]**

Command function: Tests the RSSI value and checks whether the antenna is properly installed.

Parameter description:

- **-m**: This parameter sets the band to be tested by the Mtool. Different bands of different standards are numbered in the configuration file of the Mtool. Table 5-1 lists the recommended frequency settings. For other frequency setting details, see 3GPP specifications.
- **-f**: This parameter sets the reference frequency (unit: MHz). See Table 5-1 for details.
- **-g**: This parameter sets the low-noise amplifier (LNA) level for the module. The default value is 1. The detailed parameter configuration is shown in Table 5-2 . The recommended test power range is from –70 dBm to –20 dBm. If the power is out of this range, the Mtool detects no power.
- **-pt**: This parameter sets the target value for the main RSSI test (unit: dBm). This parameter must work with parameter **-w**. If **-pt** is not configured, the Mtool does not check the target value. (default value: null)
- **-at**: This parameter sets the target value for the diversity RSSI test (unit: dBm). This parameter must work with parameter **-w**. If **-at** is not configured, the Mtool does not check the target value. (default value: null)
- **-w**: This parameter sets the limit test of RSSI (unit: dBm). This parameter must work with parameter **-pt** and -**at**. If **-pt** and **-at** are not configured, the Mtool does not check the target value. (default value: null)
- **-div**: This parameter sets the test for antenna diversity. If **-div** is not added in the command, the Mtool does not take the test for antenna diversity. (default value: null)
- **-rt**: This parameter sets the timeout duration for RSSI value

reading and must be a positive integer. The unit is s. (default value: 5)

- **-tt**: This parameter sets the number of times for RSSI value reading and is used for figuring out the average RSSI value. (default value: 1)

Example:

```
F:\Xiaogx\DCMTOOL01\Output>mtool rssi -m 9,10,11,12 -f 948,1842,1960,882 -pt -50
 -at -50 -w 60 -g 2

F:\Xiaogx\DCMTOOL01\Output>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-07-22 14:44

Search Dut Port... Pass

GSM900 RSSI TEST: -99.90   Fail
 Error Code 2

DCS1800 RSSI TEST: -99.90   Fail
 Error Code 2

PCS1900 RSSI TEST: -98.40   Fail
 Error Code 2

GSM850 RSSI TEST: -101.19   Fail
 Error Code 2

Check Dut State Before Exit... Pass
++++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

Other examples:

- Tests the main RSSI of LTE_Band1: the target power is -55 dBm, and the test threshold is –55 dBm±20 dBm.

  mtool rssi -m 21 -f 1950 -g 1 -pt -55 -w 40

- Tests the main and diversity RSSI of WCDMA2100: the target power is -55 dBm, and the test threshold is –55 dBm±20 dBm.

  mtool rssi -m 13 -f 2140 -g 1 -pt -55 -at -55 -w 40 -div

- Tests the main RSSI of CDMA800: the target power is -55 dBm, and the test threshold is –55 dBm±20 dBm.

  mtool rssi -m 2 -f 881 -g 1 -pt -55 -w 40

NOTE

- The power level indicated by the **LNA** parameter varies with modules and is used as a reference only.
- RSSI tests may not be performed in airplane mode.
- The frequency at which the instrument sets modulation signals must be the same as the parameter specified by the module.
- Only downlink frequencies are supported to be set.
- Multiple frequency bands of the same communications standard can be tested at a time. The frequency bands that follow the **-m** or **-f** parameter are separated by commas (,). When testing multiple frequency bands at a time, ensure that the **-m** and **-f** parameter orders from left to right are the same.
- If the **-pt** parameter is not set, the Mtool displays the main signal strength but does not determine whether the signal strength is within the threshold.
- If the **-at** parameter is not set, the Mtool displays the diversity signal strength but does not determine whether the signal strength is within the threshold.
- If the **-pt** or **-at** parameter has been set, set the **-w** parameter.
- Only the unit or delimiter character can follow parameter values.

Table 5-1 Huawei module test bands and recommended frequencies

Standard	m	Band	Reference Frequency (MHz)
CDMA	2	CDMA800	881.5
	3	CDMA1900	1960
	5	CDMA2100	2141.9
GSM	9	GSM900	947.4
	10	DCS1800	1842.6
	11	PCS1900	1960
	12	GSM850	882
UMTS	13	WCDMA2100	2140
	14	WCDMA1900	1960
	15	WCDMA850	880
	16	WCDMA800	880
	17	WCDMA900	942.6
	18	WCDMA1700	1862.4
	19	AWS1700	2140
	20	WCDMA_BAND19	832.5
LTE	21	LTE_B1	2140
	22	LTE_B2	1960
	23	LTE_B3	1842.5
	24	LTE_B4	2132.5
	25	LTE_B5	881.5
	26	LTE_B7	2655
	27	LTE_B8	942.5
	28	LTE_B11	1485.9
	29	LTE_B13	751
	30	LTE_B17	740
	31	LTE_B18	867.5
	32	LTE_B19	882.5
	33	LTE_B20	806
	34	LTE_B21	1503.4
	35	LTE_B25	1962.5

Standard	m	Band	Reference Frequency (MHz)
	36	LTE_B26	876.5
	46	LTE_B28	780
	56	LTE_B38	2595
	57	LTE_B39	1900
	58	LTE_B40	2350
	59	LTE_B41	2593
TD-SCDMA	65	Band A	2016.2
	70	Band F	1897.6

NOTE

If the module is developed based on Huawei's HiSilicon platform, when testing its LTE bands, the test instrument should add 0.5 MHz to the reference frequency.

Table 5-2 LNA levels and power ranges

Standard	g	LNA level	Power ranges
WCDMA	0	LNA low gain level	–106 dBm to –70 dBm
	1	LNA low gain level	–70 dBm to –44 dBm
	2	LNA middle gain level	–44 dBm to –34 dBm
	3	LNA high gain level	–34 dBm to –21 dBm
LTE	0	LNA low gain level	–109 dBm to –60 dBm
	1	LNA low gain level	–60 dBm to –45 dBm
	2	LNA middle gain level	–45 dBm to –27 dBm
	3	LNA high gain level	–27 dBm to –10 dBm
LTE (for the module developed based on Huawei's HiSilicon platform)	54	LNA low gain level	–110 dBm to –62 dBm
	48	LNA low gain level	–62 dBm to –57 dBm
	42	LNA low gain level	–57 dBm to –51 dBm
	36	LNA low gain level	–51 dBm to –45 dBm
	30	LNA middle gain level	–45 dBm to –39 dBm
	24	LNA middle gain level	–39 dBm to –33 dBm
	18	LNA middle gain level	–33 dBm to –27 dBm
	12	LNA high gain level	–26 dBm to 0 dBm
CDMA	0	LNA low gain level	–115 dBm to –75 dBm

	1	LNA low gain level	–75 dBm to –35 dBm
	2	LNA middle gain level	–35 dBm to –23 dBm
	3	LNA high gain level	–23 dBm to –13 dBm
GSM	0	LNA low gain level	–110 dBm to –95 dBm
	1	LNA low gain level	–95 dBm to –75 dBm
	2	LNA middle gain level	–75 dBm to –54 dBm
	3	LNA high gain level	–54 dBm to –11 dBm
TD-SCDMA	0	LNA low gain level	–110 dBm to –90 dBm
	1	LNA low gain level	–90 dBm to –75 dBm
	2	LNA middle gain level	–75 dBm to –50 dBm
	3	LNA high gain level	–50 dBm to –11 dBm

5.7 sim

Command syntax: **mtool sim**

Command function: Tests and displays whether the SIM card has connected to the module.

Parameter description: No parameter.

Example:

```
D:\mtool>mtool sim

D:\mtool>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-08-28 17:15

Search Dut Port... Pass

SIM CARD CHECK : Pass

Check Dut State Before Exit... Pass
++++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

NOTE

This command can be executed only in the LTE/UMTS/TD-SCDMA module.

5.8 uim

Command syntax: **mtool uim**

Command function: Tests and displays whether the UIM card has connected to the module.

Parameter description: No parameter

Example:

```
E:\Mtool\DCMTOOL01\Output>mtool uim

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2014-02-24 15:53

Search Dut port... Pass.

SIM CARD CHECK : Pass

Check Dut State Before Exit Pass
+++++++++++++++++++++++++++  END  +++++++++++++++++++++++++++++
```

NOTE

This command can be executed only in the CDMA module.

5.9 simlock

Command syntax: **mtool simlock**

Command function: Tests and displays the simlock status of the module.

Parameter description: No parameter.

Example:

```
D:\mtool>mtool simlock

D:\mtool>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-08-28 17:16

Search Dut Port... Pass

SIM-Lock CHECK: Pass
 SIM-Lock State : Disable

Check Dut State Before Exit... Pass
+++++++++++++++++++++++++++  END  +++++++++++++++++++++++++++++
```

NOTE

This command can be executed only in the LTE/UMTS/TD-SCDMA module.

5.10 bodysar

Command syntax: **mtool bodysar**

Command function: Tests and displays the bodysar status of the module as well as the bodysar settings of each communications standard supported by the module.

Parameter description: No parameter.

Example:

```
E:\Mtool\DCMTOOL01\Output>mtool bodysar

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2014-02-24 15:52

Search Dut port... Pass.

BODYSAR CHECK : Pass
 BODYSAR : OFF
 BODYSARWCDMA : (22,3FFFFFFF)
 BODYSARGSM : (30,00000003),(29,0000000c),(26,00030000),(25,000c0000)
Check Dut State Before Exit Pass
+++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

5.11 gps

Command syntax: **mtool gps [-t CN0 target]**

Command function: Tests whether the GPS antenna is properly installed based on the highest carrier-to-noise ratio (CNR), namely, CN0.

Parameter description: **-t**: This parameter sets the CNR threshold, which must be a positive integer. If this parameter is set, the Mtool compares the obtained CNR with the specified CNR. If the obtained CNR is lower than the specified CNR, an error is reported. If this parameter is not set, the Mtool does not compare the obtained CNR with the specified CNR.

Example:

```
F:\Xiaogx\DCMTOOL01\Output>mtool gps -t 30

F:\Xiaogx\DCMTOOL01\Output>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-07-22 14:49

Search Dut Port... Pass

GPS CHECK: Fail
 No Satellite

Check Dut State Before Exit... Pass
+++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

NOTE

GPS signal input is required during the test. You are advised to use a GPS analog signal source for the test.

5.12 iccid

Command syntax: **mtool iccid**

Command function: Tests and displays the SIM card's ICCID number.

Parameter description: No parameter.

Example:

```
D:\mtool>mtool iccid

D:\mtool>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-08-28 17:18

Search Dut Port... Pass

ICCID CHECK: Pass
 ICCID : 00?403#144195P806701

Check Dut State Before Exit... Pass
++++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

5.13 cbsar

Command syntax: **mtool cbsar [-tt totaltime] [-it intervaltime] [-ct count]**

Command function: Detects the status of the BODYSAR switch. This test is passed when the number of detected status changes reaches or exceeds the setting value.

Parameter description: **-tt**: test duration in ms. The value contains a maximum of 20 digits, and the default value is 60000.

-it: sampling time in ms, which is the interval for detecting the BODYSAR switch status. The value contains a maximum of 20 digits, and the default value is 1000.

-ct: number of the BODYSAR switch's status changes. The value contains a maximum of 20 digits, and the default value is 0. If the value is set to 0, the Mtool obtains the BODYSAR switch status, but does not judge whether the status has changed.

Example:

```
F:\Xiaogx\DCMTOOL01\Output>mtool cbsar -tt 20000 -it 1000 -ct 5

F:\Xiaogx\DCMTOOL01\Output>
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Date : 2015-06-24 13:55

Search Dut Port... Pass
 BODYSAR Control Pass

Check Dut State Before Exit... Pass
+++++++++++++++++++++++++  END  ++++++++++++++++++++++++++++
```

NOTE

-tt, -it and -ct are user-defined. In real-world situations, the number of status changes detected by the Mtool is often inconsistent with the actual number of switch toggling times. Therefore, to obtain the accurate number of the BODYSAR switch's status changes, observe the status change information produced by the Mtool and manually calculate the number.

6 Windows Interface Operation Guide

6.1 Function Overview

The Mtool also supports Windows operating systems.

Windows operating systems can run properly only after the **config.ini** file is configured correctly. The **config.ini** file and Mtool's executable programs must be placed in the same path.

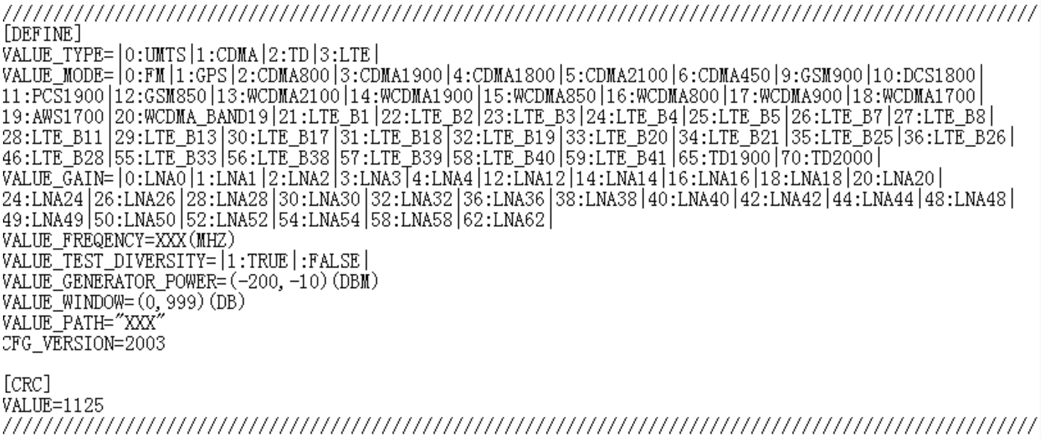
6.2 Configuration File Description

Configuration items: [SYSTEM] and [TYPE] fields must be configured for console or interface commands. Other fields are configured only for interface commands.

The configuration file is made up of the configurable part and read-only part.

The read-only part is the later part of the configuration file and describes parameters. Determine the settings in the configurable part based on the settings in the read-only part. Use the character strings that follow the colons (:) but do not use the numbers in front of the colons (:) during the configuration. Do not alter the read-only part. Otherwise, programs cannot start.

The following figure shows the read-only part of the configuration file.



```
////////////////////////////////////////////////////////////////////////////////////////////////
[DEFINE]
VALUE_TYPE=|0:UMTS|1:CDMA|2:TD|3:LTE|
VALUE_MODE=|0:FM|1:GPS|2:CDMA800|3:CDMA1900|4:CDMA1800|5:CDMA2100|6:CDMA450|9:GSM900|10:DCS1800|
11:PCS1900|12:GSM850|13:WCDMA2100|14:WCDMA1900|15:WCDMA850|16:WCDMA800|17:WCDMA900|18:WCDMA1700|
19:AWS1700|20:WCDMA_BAND19|21:LTE_B1|22:LTE_B2|23:LTE_B3|24:LTE_B4|25:LTE_B5|26:LTE_B7|27:LTE_B8|
28:LTE_B11|29:LTE_B13|30:LTE_B17|31:LTE_B18|32:LTE_B19|33:LTE_B20|34:LTE_B21|35:LTE_B25|36:LTE_B26|
46:LTE_B28|55:LTE_B33|56:LTE_B38|57:LTE_B39|58:LTE_B40|59:LTE_B41|65:TD1900|70:TD2000|
VALUE_GAIN=|0:LNA0|1:LNA1|2:LNA2|3:LNA3|4:LNA4|12:LNA12|14:LNA14|16:LNA16|18:LNA18|20:LNA20|
24:LNA24|26:LNA26|28:LNA28|30:LNA30|32:LNA32|36:LNA36|38:LNA38|40:LNA40|42:LNA42|44:LNA44|48:LNA48|
49:LNA49|50:LNA50|52:LNA52|54:LNA54|58:LNA58|62:LNA62|
VALUE_FREQENCY=XXX(MHZ)
VALUE_TEST_DIVERSITY=|1:TRUE|:FALSE|
VALUE_GENERATOR_POWER=(-200,-10)(DBM)
VALUE_WINDOW=(0,999)(DB)
VALUE_PATH="XXX"
CFG_VERSION=2003

[CRC]
VALUE=1125
////////////////////////////////////////////////////////////////////////////////////////////////
```

The following figure shows the configurable part of the configuration file. The parameters in the configurable part must be entered in uppercase.

```
[SYSTEM]
TYPE=

[TYPE]
DEFAULT=UMTS

[PORTNAME]
CHOOSED=FALSE
NAME=Application Interface

[CONFIG]
CHOOSED=FALSE
FIRMWARE_VERSION=
HARDWARE_VERSION=

[RSSI]
CHOOSED=FALSE
MODE=WCDMA2100
GAIN=LNA1
FREQENCY=2140
TEST_DIVERSITY=TRUE
PRIMARY_TARGET=-85 DBM
AUX_TARGET=
WINDOW=10 DB

[ICCID]
CHOOSED=FALSE

[UIM/SIM]
CHOOSED=FALSE

[SIMLOCK]
CHOOSED=FALSE

[BODYSAR]
CHOOSED=FALSE

[CBSAR]
CHOOSED=TRUE
TOTALTIME=60000
INTERVALTIME=1000
COUNT=0

[GPS]
CHOOSED=FALSE
TARGET=

[AUTO_TEST]
CHOOSED=FALSE

[AUTO_EXIT]
CHOOSED=FALSE

[LOG]
CHOOSED=FALSE
OVERWRITE=FALSE
PATH=C:/hw_tool.txt
```

6.2.1 [SYSTEM]

TYPE: Sets the type of the operating system.

Usage:
- For WINXP/WIN7/WIN8/WIN10 and other non-WINPE operating system, TYPE can be left blank.
- For WINPE operating system, set TYPE to WINPE.

6.2.2 [TYPE]

DEFAULT: Sets the network type of the tested module.

Usage:
- If the network type of the tested module is Code Division Multiple Access (CDMA), the value of DEFAULT is CDMA.
- If the network type of the tested module is Time Division-Synchronous Code Division Multiple Access (TD-SCDMA), the value of DEFAULT is TD.
- If the network type of the tested module is Universal Mobile Telecommunications System (UMTS), the value of DEFAULT is UMTS.
- If the network type of the tested module is Long Term Evolution (LTE), the value of DEFAULT is LTE.

NOTE

The value of DEFAULT should be consistent with the network mode supported by the tested module.

6.2.3 [PORTNAME]

CHOOSED: Indicates whether to use the user-defined port name for port search.

NAME: Indicates the port name. For example, the name is PC UI. The Mtool uses PC UI as a keyword to search for ports. If the name of a port in the device manager is found to contain PC UI, the Mtool uses this port as a communication port.

Usage:
- CHOOSED=TRUE indicates that the Mtool uses the user-defined port for tests.
- CHOOSED=FALSE indicates that the Mtool uses the default key words to search for ports.

NOTE

- Mtool can circularly search the module's ports and MBIM port. After it searches one, Mtool stops searching immediately and then uses the port for communication.
- For the MBIM port, the preferential default key words are Broadband Module. If no port is found, the Mtool then uses 4G Module as the key words.
- For other port, the default key words are PC UI.
- The [PORTNAME] field takes effect for console and Windows interface commands.
- If the port name mapped by the module in the operating system does not contain the default keyword, configure the [PORTNAME] field so that the Mtool can locate the port.

6.2.4 [CONFIG]

CHOOSED:	Indicates whether to test module's basic information, including the module name, software version, hardware version, IMEI/MEID and IMSI.
FIRMWARE_VERSION:	Compares the target software version. (default value: null)
HARDWARE_VERSION:	Compares the target hardware version. (default value: null)
Usage:	If FIRMWARE_VERSION and HARDWARE_VERSION are set, the Mtool will verify the hardware version number and software version number, query and print module' name, IMEI/MEID, and IMSI.

6.2.5 [RSSI]

CHOOSED:	Specifies whether to enable the main and diversity antenna connectivity test.
MODE:	Indicates the index of the band to be tested. For details, see the read-only part description in section 6.2 .
GAIN:	Indicates the gain level, default value: LNA1. For details, see the read-only part description in section 6.2 .
FREQENCY:	Indicates the test frequency. The unit is MHz. For details, see section 5.6 .
TEST_DIVERSITY:	Indicates whether the Mtool tests the diversity antenna.
PRIMARY_TARGET:	Indicates the main RSSI target value, which must work with WINDOW parameters. The unit is dBm.
AUX_TARGET:	Indicates the diversity RSSI target value, which must work with WINDOW parameters. The unit is dBm.
WINDOW:	Indicates the test value threshold window. The unit is dBm. It takes effect only when PRIMARY_TARGET or AUX_TARGET is set to a valid value.

NOTE

- The power level indicated by the **LNA** parameter varies with modules and is used as a reference only.
- RSSI tests may not be performed properly in airplane mode.
- The frequency at which the instrument sets modulation signals must be the same as the parameter specified by the module.
- Only downlink frequencies are supported to be set.
- Multiple frequency bands of the same communications standard can be tested at a time. The frequency bands that follow MODE or FREQENCY are separated by vertical bars (|). When testing multiple frequency bands at a time, ensure that the parameter orders in MODE and FREQENCY from left to right are the same. Do not use any vertical bar (|) to separate the last frequency band and frequency.

- RSSI test thresholds are determined by AUX_TARGET and WINDOW. For example, if AUX_TARGET is set to –55 and WINDOW is set to 60, the lower RSSI test threshold is –55-60/2 and the upper RSSI test threshold is –55+60/2.
- You can optionally add units to the values of FREQENCY, PRIMARY_TARGET, AUX_TARGET, and WINDOW. If you attempt to add a unit, place the unit next to the value without any other characters.
- If PRIMARY_TARGET is not set, PRIMARY_TARGET= indicates that the Mtool displays the main signal strength but does not determine whether the signal strength is within the threshold.
- If AUX_TARGET is not set, AUX_TARGET= indicates that the Mtool displays the diversity signal strength but does not determine whether the signal strength is within the threshold.
- If PRIMARY_TARGET or AUX_TARGET is set, set WINDOW.

6.2.6 [ICCID]

CHOOSED: Indicates whether to test and display SIM card's ICCID.

Usage:
- CHOOSED=TRUE indicates testing ICCID of the module.
- CHOOSED=FALSE indicates not testing ICCID of the module.

6.2.7 [UIM/SIM]

CHOOSED: Enables or disables the test to check whether the UIM/SIM card is in position.

Usage: CHOOSED=TRUE indicates testing the UIM/SIM card's in-position status and displaying the test result.

CHOOSED=FALSE indicates not testing.

6.2.8 [SIMLOCK]

CHOOSED: Enables or disables the test to check whether the SIMLock function is enabled.

Usage: CHOOSED=TRUE indicates testing the SIM-Lock's enabling status and displaying the test result.

CHOOSED=FALSE indicates not testing.

NOTE

This command can be executed only in the LTE/UMTS/TD-SCDMA module.

6.2.9 [BODYSAR]

CHOOSED: Tests and displays the BODYSAR status of the module as well as the BODYSAR settings of each communications standard supported by the module.

Usage: CHOOSED=TRUE indicates the bodysar function is enabled.

CHOOSED=FALSE indicates the bodysar function is disabled.

6.2.10 [GPS]

CHOOSED: Indicates whether to enable the function of detecting GPS antenna connectivity.

TARGET: Sets GPS signal strength to be queried.

Usage:
- CHOOSED=TRUE indicates this function is enabled.
- CHOOSED=FALSE indicates this function is disabled.
- TARGET=XX indicates that the CNR threshold is *xx*, which must be a positive integer. If this parameter is not set, TARGET= indicates that the Mtool displays the obtained signal strength but does not determine whether the strength is within the threshold.

6.2.11 [AUTO_TEST]

CHOOSED: Indicates whether the automatic test is enabled.

Usage:
- CHOOSED=TRUE indicates this function is enabled.
- CHOOSED=FALSE indicates this function is disabled.

6.2.12 [AUTO_EXIT]

CHOOSED: Indicates whether to automatically exit the test program after the test succeeds.

Usage:
- CHOOSED=TRUE indicates this function is enabled.
- CHOOSED=FALSE indicates this function is disabled.

6.2.13 [LOG]

CHOOSED: Specifies whether to set the save path for the test result log.

OVERWRITE: Specifies whether the write mode is overwrite. (default value: FALSE)

PATH: Indicates the log save path.

Usage:
- CHOOSED=TRUE indicates that the test results will be saved to the user-defined save path.
- CHOOSED=FALSE indicates that the test results will be saved to the **pass.txt** or **fail.txt** file in the installation directory of the Mtool.
- OVERWRITE=TRUE indicates the write mode is overwrite.
- OVERWRITE=FALSE indicates that the write mode is add.

6.2.14 [CBSAR]

CHOOSED: Indicates whether to enable the function of detecting the BODYSAR switch status.

TOTALTIME: Indicates the test duration

INTERVALTIME: Indicates the sampling time, which is the interval for detecting the BODYSAR switch status.

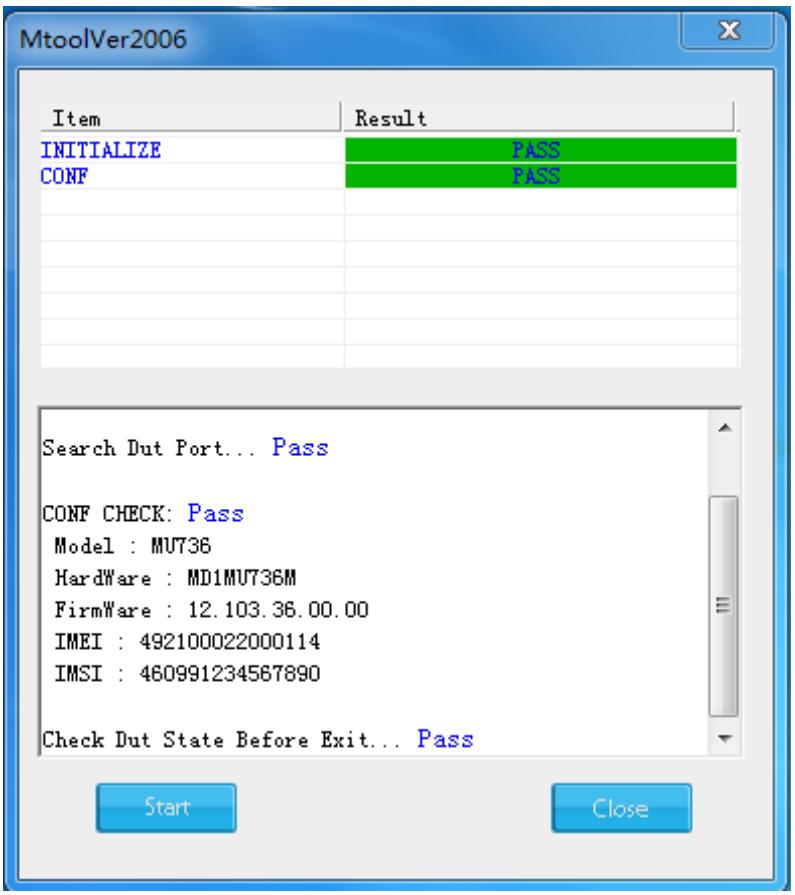
COUNT: Indicates the number of the BODYSAR switch's status change.

Usage:

- CHOOSED=TRUE indicates that this function is enabled.
- CHOOSED=FALSE indicates that this function is disabled.
- TOTALTIME=XX indicates the test duration in ms. The default value is 60000.
- INTERVALTIME=XX indicates the sampling time in ms, which is the interval for detecting the BODYSAR switch status. The default value is 1000.
- COUNT=XX indicates the number of the BODYSAR switch's status change. The default value is 0.

6.3 Interface Operation Description

After the **config.ini** file is configured, run the Mtool to start the test, as shown in the following figure.



7 Error Messages

Error Message	Description
Error Code 1	Both main and auxiliary RSSI values do not meet threshold conditions
Error Code 2	Main RSSI values do not meet threshold conditions
Error Code 3	Auxiliary RSSI values do not meet threshold conditions
Error Code 4	No response, time out
Error Code 5	Invalid parameters or parameters missing
Error Code 6-99	Any other error undefined

8 Saving Test Results

8.1 Setting the Log Save Path

- Method 1:

  On the Windows command line interface, use the **-p** command to set the test results save path:

  mtool rssi -m 19 -f 1950 -g 1 -pt -55 -w 100 -p e:/hw_log.txt

  In this command, **e:/hw_log.txt** after the parameter **-p** indicates that the test results will be saved to the **hw_log txt.** file on drive E. The path must contain the drive and the **.txt** log file name.

  If the parameter is not configured, the test results will be saved to the **pass. txt** or **fail. txt** file in the installation directory of the Mtool by default, depending on the test results.

- Method 2:

  On the Windows operation interface, you can set the log save path by configuring the Mtool configuration file. Under the configuration item LOG in the configuration file, if CHOOSED is set to TRUE, the test results will be saved to the user-defined save path. If CHOOSED is set to FALSE, the test results will be saved to the **pass.txt** or **fail.txt** file in the installation directory of the Mtool, depending on the test results.

8.2 Setting the Log Save Mode

Method 1:

On the Windows command line interface, run **-ow**.

This command indicates that the write mode is overwrite. If there is no parameter **-ow**, the write mode is add.

Method 2:

On the Windows operation interface, run **config.ini**.

If OVERWRITE is set to TRUE, the write mode is overwrite; if OVERWRITE is set to FALSE, the write mode is add.

Example:

mtool conf -p e:/hw_tool.txt -ow

mtool rssi -m 19 -f 1950 -g 1 -pt -55 -w 30 -ow

9 FAQ

9.1 Why the Mtool Is Not Functioning in the WinPE System and Mtool Breakdown or System Errors Occur?

Troubleshooting procedure:

1. Check whether the **oledlg.dll** file is absent from the WINPE system. If yes, copy this file from the complete operating system to the WINPE system.
2. Check whether the login account is the administrator.

   If you log in to the Mtool not as an administrator, the Mtool fails to create resource and result files as required.

9.2 Why Does the Mtool Fail to Obtain Ports of Modules?

Troubleshooting procedure:

1. Check whether the module driver is installed properly and whether modules are mapped properly in the device manager. If a module fails to be mapped, check whether the module starts or whether the driver is installed properly.
2. Check whether the PORTNAME field is configured in the **config.ini** file.

   By default, the Mtool uses the keyword **PC UI** to match ports of the Windows XP, Windows 7, and WINPE systems and uses the keywords **Broadband Module** and **4G Module** to match ports of the Windows 8 and Windows 8.1 systems. If the names of the ports mapped in the device manager of a system do not contain the related keywords, configure the PORTNAME field in the **config.ini** file.

   For configuration details, see section 6.2.3 [PORTNAME]. Then the Mtool can obtain ports based on the keywords.

9.3 Why the SIM/UIM Detection Failure Is Displayed Even When the Mtool Test Result Indicates the Insertion of the SIM Card?

Troubleshooting procedure:

1. Check that the pin of the SIM card is properly connected.
2. Check that the personal identification number (PIN) of the SIM card is unlocked.

9.4 Why the config.ini File Cannot Be Opened When the Mtool Is Running?

Troubleshooting procedure:

Copy the **config.ini** file to the same path where the Mtool is installed.

9.5 Why Is the Result File Not Generated If "Command Undefined" Is Displayed Due to Incorrect Parameter Input?

Troubleshooting procedure:

Check that the specified parameters are correct.

The Mtool generates result files only when the configuration items are running.

9.6 Why Do MEIDs/ESNs of Modules Fail to Be Detected When Configurations Are Correct?

Troubleshooting procedure:

- Check that modules can detect valid SIM cards.
- Check that modules support CDMA and work in CDMA mode.

10 Acronyms and Abbreviations

Acronyms and Abbreviations	Expansion
3GPP	3rd Generation Partnership Project
AWS	Advanced Wireless Services
CDMA	Code Division Multiple Access
CNR	Carrier-To-Noise Ratio
DCS	Digital Cellular System
GPS	Global Positioning System
GSM	Global System For Mobile Communication
ICCID	Integrated Circuit Card Identity
IMEI	International Mobile Equipment Identify
IMSI	International Mobile Subscriber Identity
LNA	Low Noise Amplifier
LTE	Long Term Evolution
MEID	Mobile Equipment Identifier
PCS	Personal Communications Service
RF	Radio Frequency
RSSI	Received Signal Strength Indicator
SIM	Subscriber Identity Module
TD-SCDMA	Time Division-Synchronous Code Division Multiple Access
UMTS	Universal Mobile Telecommunications System
WCDMA	Wideband Code Division Multiple Access