



MT-1040 Wireless Multi-deviced Tester System

User's Guide

(2016/07/30 V2.00)

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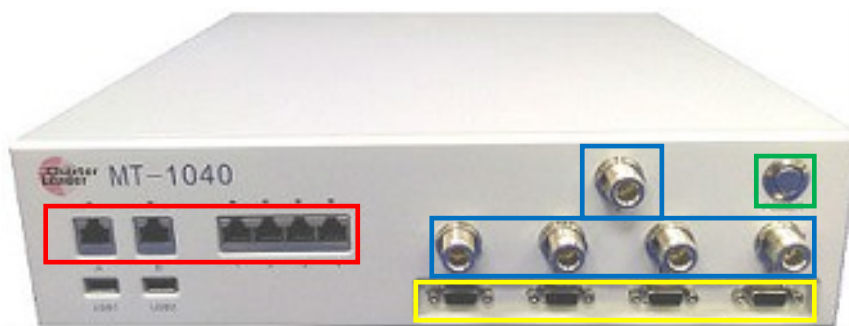
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1 Brief Introduction

MT-1040, Wireless Multi-deviced Tester System, is a testing system, which enables multi-devices to be tested at the same time, ideal for RF testing in mass production.

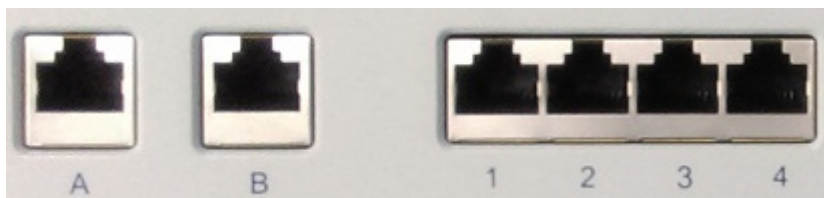
The principle of MT-1040 is to use high-isolated RF switch module, with high efficient testing structures and effective software control, to maximize the utilization rate of tester machine, and hence achieve the goals of reducing production cost and increasing the productivity.

2 Hardware Descriptions



2.1 Ethernet Module

The area with red block is Ethernet module



Port 1: Connect with DUT1.

Port 2: Connect with DUT2

Port 3: Connect with DUT3

Port 4: Connect with DUT4

Port A: Connect with testing computer to communicate with MT-1040 for testing control.

Port B: Connect with tester, for example, IQflex.

LED indicator:

LED 1: Indicator of port 1

LED 2: Indicator of port 2

LED 3: Indicator of port 3

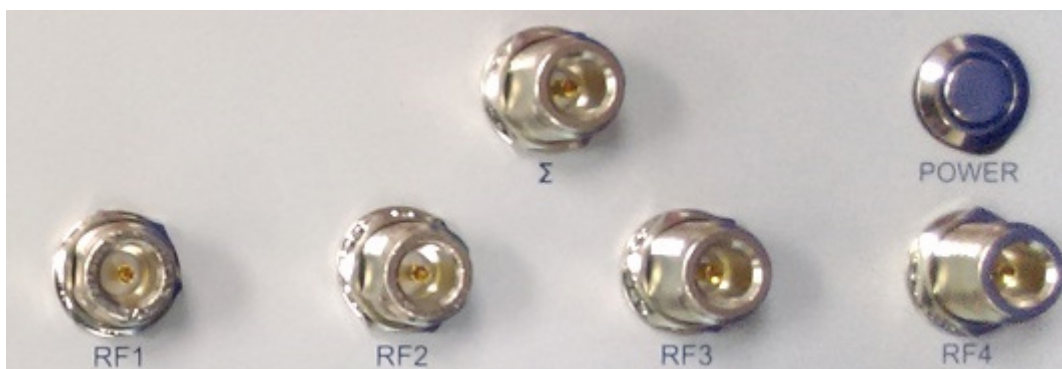
LED 4: Indicator of port 4

LED A: Indicator of port A

LED B: Indicator of port B

2.2 RF Module

The area with blue block is Ethernet module



Σ : RF port connects with RF tester

RF1: RF port connects with DUT1

RF2: RF port connects with DUT2

RF3: RF port connects with DUT3

RF4: RF port connects with DUT4

Remark:

Please ensure the maximum input power of each RF port (RF1, RF2, RF3, RF4) is lower than 20dBm (the common solution is to install the appropriate attenuator on the shielding box or RF port.)

2.3 UART Module



1: Connects with DUT1

2: Connects with DUT2

3 : Connects with DUT3

4: Connects with DUT4

2.4 Power Switch



Green area is the power switch. There is a power light in the switch. It is blue when power is on. Press the button once to switch on. Long press the button is to switch off.

Suggestion:

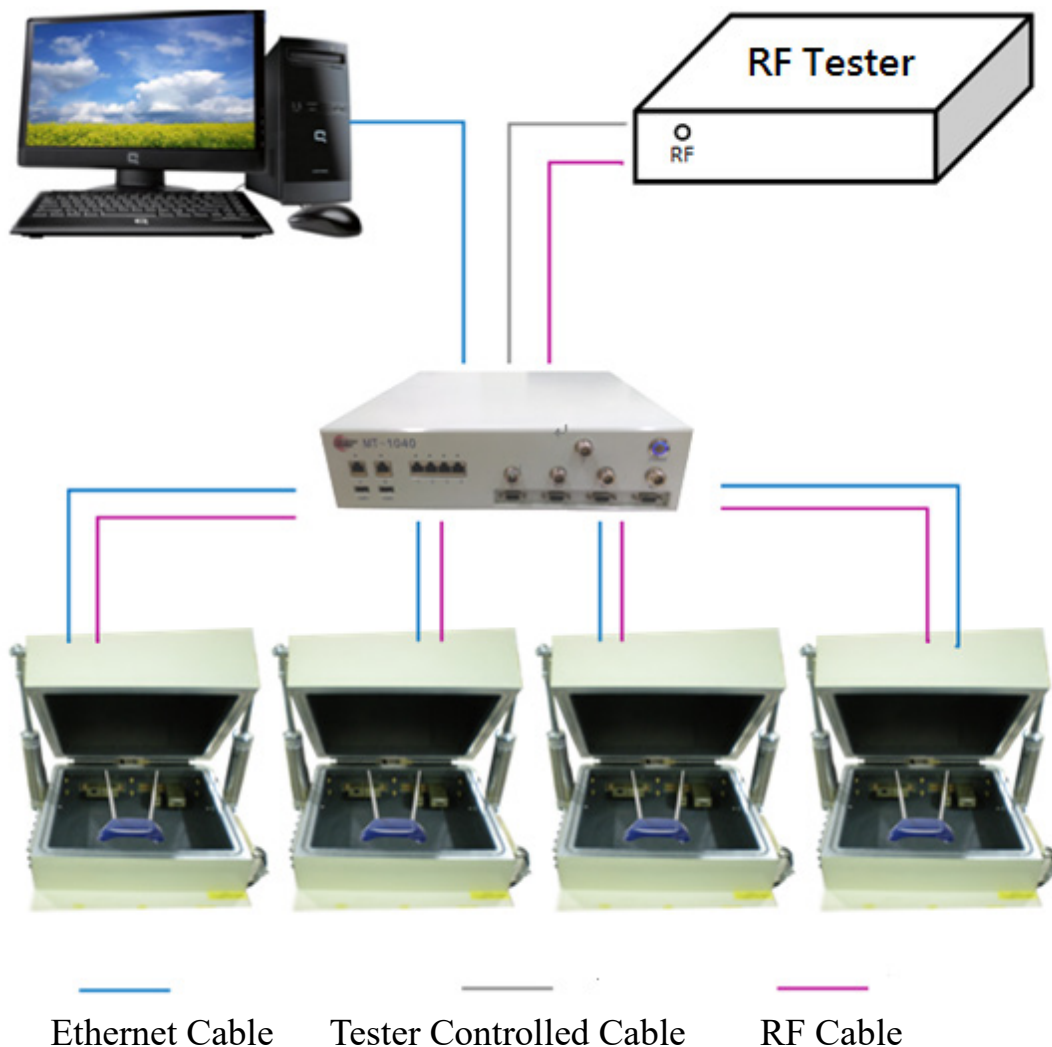
Press the switch button to power on and use “Power Off Server” in “tool” contained in the control panel to switch off the power.

3 Testing Environment

The following are the cases of High-Efficient Platform Interface, Self-controlled Platform Interface, and Supplement Platform Interface.

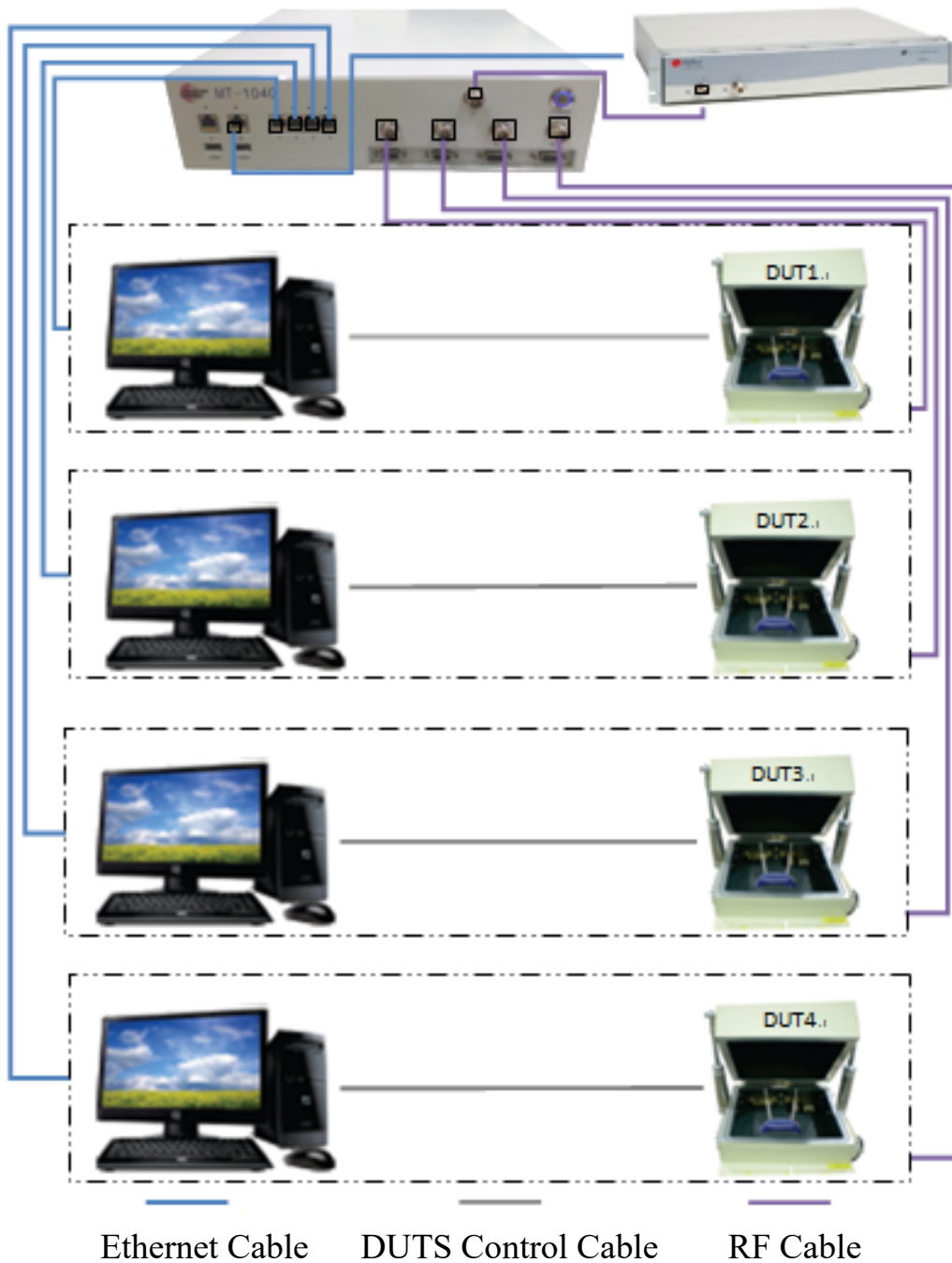
3.1 Typical case

This is the typical environment of using High-Efficient Platform Interface to achieve the efficiency of one personnel operating testing for 4 DUTS .



3.2 Other Case

This is the case of using Self-Controlled Platform Interface. This platform is designed for the users who want to use the existing program, or test different products simultaneously or want to control DUTS by themselves.



4 Specifications

4.1 Ethernet Module

Port Speed: 10M/100M/1000M auto-negotiation

4.2 RF Module

Interface Type : N Female Type

Frequency Range: $\leq 8\text{GHz}$

Max Input Power: +26dBm

Isolation : $> 90\text{dB}$

V.S.W.R : $\leq 3\text{GHz}$: 1.22

$3\text{GHz} \sim 6\text{GHz}$: 1.32

$\geq 6\text{GHz}$: 1.43

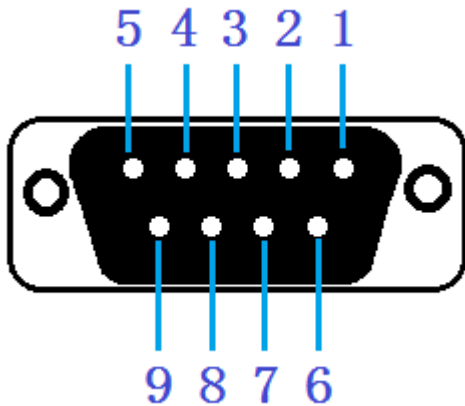
Attenuation : $< 4\text{dB}$

Switch Times : No limit under normal conditions

Remark:

Please ensure the maximum input power of each RF port (RF1, RF2, RF3, RF4) is lower than 20dBm (the common solution is to install the appropriate attenuator on the shielding box or RF port.)

4.3 UART Module



Interface Types: RS-232, DB9, Female Type

Pin Definitions:

2: RXD

3: TXD

5: GND

6: DC 3.3V

9: DC 5.0V

1,4,7,8: reserved

4.4 MT-1040 Parameters

Dimensions : 9cm x 35cm x 35cm (H x W x D)

Weight : 7.5Kg

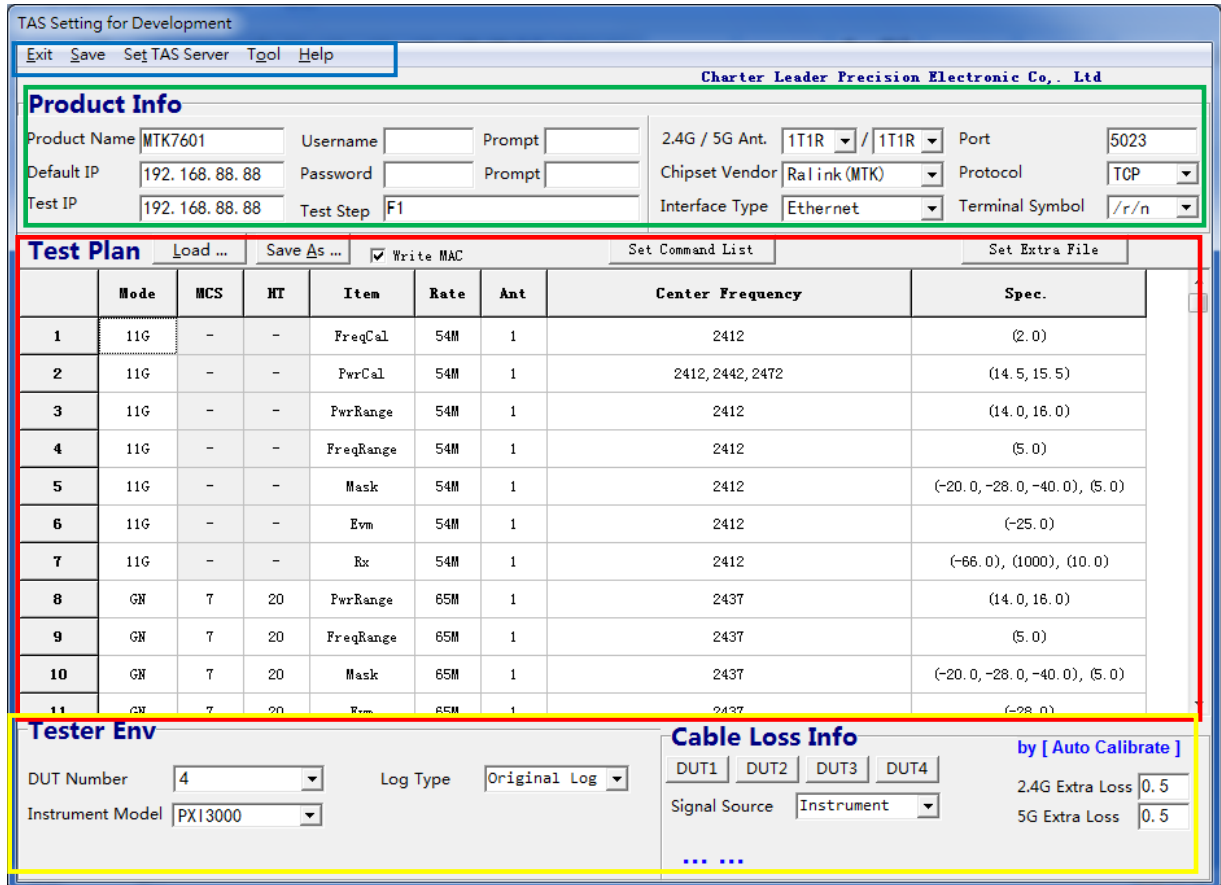
Operation Temperature : 0°C- 45°C

Humidity : 20% ~ 80%

Power : AC 100V - 240V, 50/60Hz

5 Control Panel

TAS Control Panel:



Product Info

Product Name: MTK7601 Username: Prompt: 2.4G / 5G Ant: 1T1R / 1T1R Port: 5023
 Default IP: 192.168.88.88 Password: Prompt: Chipset Vendor: Ralink (MTK) Protocol: TCP
 Test IP: 192.168.88.88 Test Step: F1 Interface Type: Ethernet Terminal Symbol: /r/n

Test Plan Load ... Save As ... Write MAC Set Command List Set Extra File

	Mode	MCS	HT	Item	Rate	Ant	Center Frequency	Spec.
1	11G	-	-	FreqCal	54M	1	2412	(2.0)
2	11G	-	-	PwrCal	54M	1	2412, 2442, 2472	(14.5, 15.5)
3	11G	-	-	PwrRange	54M	1	2412	(14.0, 16.0)
4	11G	-	-	FreqRange	54M	1	2412	(5.0)
5	11G	-	-	Mask	54M	1	2412	(-20.0, -28.0, -40.0), (5.0)
6	11G	-	-	Evm	54M	1	2412	(-25.0)
7	11G	-	-	Rx	54M	1	2412	(-66.0), (1000), (10.0)
8	GN	7	20	PwrRange	65M	1	2437	(14.0, 16.0)
9	GN	7	20	FreqRange	65M	1	2437	(5.0)
10	GN	7	20	Mask	65M	1	2437	(-20.0, -28.0, -40.0), (5.0)
11	GN	7	20	Evm	65M	1	2437	(-28.0)

Tester Env **Cable Loss Info** by [Auto Calibrate]

DUT Number: 4 Log Type: Original Log DUT1 DUT2 DUT3 DUT4
 Instrument Model: PXI3000 Signal Source: Instrument 2.4G Extra Loss: 0.5
 5G Extra Loss: 0.5

Blue Block : Menu

Green Block: Product Information

Red Block : Test Plan

Yellow Block: Tester Environment and Cable Loss Information

5.1 Menu

Exit: Quit from control panel.

Save: Save the contents which have been modified.

Set TAS Server: Setup information of MT-1040.

The contents of Submenu are explained as follows:

Set TAS Server: Send environmental information into MT-1040.

Set Cable Loss Info: Set the cable loss files, *tas_loss1.txt*,

tas_loss2.txt, *tas_loss3.txt*, *tas_loss4.txt* to

MT-1040.

Auto Cable Loss Cal.: Utilize the cable loss calibration tool. Be sure to set the field of “2.4G Extra Loss”, “5G Extra Loss”

Tool: Control function for MT-1040

View TAS Settings: Retrieve current MT-1040 information to control panel.

Test TAS: To do DUT1 verification test, which enables to set test cycles and do ping test.

Reset TAS: Reset MT-1040 (no power off)

Reboot Server: Reboot MT-1040 (will power off and reboot again)

Power Off Server: Turn off MT-1040 (power off)

Enable RF:

Port1: Enable RF1 this port on. (Connect Σ with RF1)

Port2: Enable RF2 this port on. (Connect Σ with RF2)

Port3: Enable RF3 this port on. (Connect Σ with RF3)

Port4: Enable RF4 this port on. (Connect Σ with RF4)

Language: Select English or Chinese

Help: help information.

5.2 Product Information

Product Name: DUT model name

Default IP: DUT default IP

Test IP: DUT testing IP, normally same as default IP

Username: Login user name

Password: Login password

Prompt: Prompts for Username and Password input

Test Step: Test station name

2.4G / 5G Ant.: DUT antenna usage of 2.4G and 5G

Chipset Vendor: DUT chipset vendor

Interface Type: DUT control interface

Port: The port number of control protocol

Protocol: Control protocol type

Terminal Symbol: Command ending symbol

5.3 Test Plan

Write MAC: Enable or disable MAC programming when test finished

Set Command List: Setup DUT' s control commands

Set Extra File: Define files list for testing and upload to DUT

Mode: Signal mode

MCS: Signal modulation type

HT: Bandwidth

Item: Test item

Rate: Data rate

Ant: Antenna selection

Remark: The number in selection is actual antenna selected for frequency offset calibration, for example, selecting 2, means to calibrate antenna 2

Center Frequency: Central frequency of testing signal

Spec. : Criteria of test item

5.4 Testing Environment

DUT Number: DUT count on testing

Instrument Model: Wireless tester model number

Instrument IP: Tester' s IP

Use Right Port: Select RF port of IQ tester (Click it to select the use of tester' s right port or left port)

Log Type:

Original Log: Log contains normal test flow information

Format Log: Log summarizes only test results of all test items

Combiner Log: Log combines above 2 log contents

DUT1: Cable loss information of DUT 1

DUT2: Cable loss information of DUT 2

DUT3: Cable loss information of DUT 3

DUT4: Cable loss information of DUT 4

Signal Source: Signal source for cable loss calibration.

2.4G Extra Loss: When use “Auto Cable Loss Cal.” to automatically calibrate cable loss at 2.4G frequency band, some parts maybe not be included in calibration process, hence putting the estimated compensation loss for 2.4G in this field is needed.

5G Extra Loss: When use “Auto Cable Loss Cal.” to automatically calibrate cable loss at 5G frequency band, some parts maybe not be included in calibration process, hence putting the estimated compensation loss for 5G in this field is needed.

Remark: The illustrations of blue words at position above the “**2.4G Extra Loss**” are as follows:

The default message is by [.]”;

If use menu of “Set Cable Loss” to edit cable loss files, then it will show “by [Manual Set]”; If use menu of “Auto Cable Loss Cal.” to calibrate loss, then it will show “by [Auto Calibrate]”; After that, it will keep the last cable loss process type (“by [Manual Set]” or “by [Auto Calibrate]”).

5.5 Setting Operation

5.5.1 Product Information

Directly input the information to the product information block, and then click “save”. After it is done, select “Set TAS Server” in the menu “Set TAS Server” to send the updated information into MT-1040.

5.5.2 DUT Number Setting

Directly set the “DUT Number” at tester environment block, and then click “save” to save the setting. After it is done, select “Set TAS Server” in the menu “Set TAS Server” to send the updated information into MT-1040.

5.5.3 Instrument Setting

Directly set “Instrument Model” and “Instrument IP” (PXI3000 does not need IP.) in the testing environment, and then click “Save”. After it is done, select “Set TAS Server” in the menu “Set TAS Server” to send the updated information into MT-1040.

5.5.4 Modify Cable Loss Manually

In cable loss information block, press the button corresponding to DUT that needs to change its cable loss. For example: If you want to

modify cable loss of DUT2, then click “DUT2” button, etc.

Set the cable loss in the opened text document, and then save it, closing the document. Select “Set Cable Loss” to send it into MT-1040.

Under the condition of manual setting, all the cable loss information needs to be summarized and put into document. “2.4G Extra Loss” and “5G Extra Loss” settings must be ignored.

5.5.5 Automatic Cable Loss Calibration

Set “2.4G Extra Loss” and “5G Extra Loss” in the cable loss information block, and then click “save” to save it. After it is done, select menu “Auto Cable Loss Cal.” to proceed calibration.

Before using automatic calibration, the settings of “2.4G Extra Loss” and “5G Extra Loss” must be done, because these values shall be compensated.

When calibration process fails, please check if the cable and its plugs go loose or damaged. After finishing checking or replacement, re-start cable loss calibration.

If the outcome of automatic calibration is unsatisfactory, please modify cable loss information manually.

Note: 5.5.4 and 5.5.5 are alternative. If both steps are done, the last step taken will come into effectively.

5.5.6 Confirmation

After finishing setting process, it is suggested to use menu “View TAS Settings” to retrieve the setting information from MT-1040 onto control panel in order to confirm if the setting is successfully done.

6 Trouble Shooting

Trouble descriptions	Check Items
Power light of MT-1040 is not on.	<p>Please check if the front panel switch is on or not.</p> <p>Please check the power switch near the power socket at the back panel.</p> <p>Please check the power cord connection on the back panel.</p>
Unable to connect to MT-1040.	<p>Please check if the power is on.</p> <p>Please check if the power light is on.</p> <p>Please check if the network port’s segment, which connect to MT-1040 port A is correct.</p>
Fail to connect DUT when undertaking testing.	<p>Please check if DUT is connected with power.</p> <p>Please check if DUT connects with Ethernet module correctly.</p>
No power on DUT when testing.	<p>Please check if DUT is connected with power.</p> <p>Please check if DUT connects with RF module</p>



	correctly
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7 Appendix

7.1 Appendix 1

LogFile : The original contents

```

Start Test DUT 1
----- POST -----
192.168.0.100 Ping 192.168.0.1 ok
Connect ...
Connect OK
Open DUT Ok
-----Freq Cal(2.4G)-----
Power: 16.0971371755782(DAC: 40)
Offset: 30, ppm: -0.45(-10~10) PASS
-----Power Cal(2.4G)-----
Rate 54M
  ANT 0 Rate 54M Ch: 2412 Power: 14.75 dBm(14.0~15.0) DAC: 38 PASS
  ANT 0 Rate 54M Ch: 2442 Power: 15.15 dBm(14.0~15.0) DAC: 39 PASS
  ANT 0 Rate 54M Ch: 2472 Power: 16.01 dBm(14.0~15.0) DAC: 43 PASS
-----Tx Verify-----
ant 0
  2442 11M
PowerIndex0:36
  power   : 17.28 dBm ( 15.50 ..... 19.50)
  FreqErr : -2.43 ppm (-20.00 ..... 20.00)
  mask    : 0.00 % ( 0.00 ..... 5.00)
  evm     : -24.10 dB (-45.00 ..... -10.00)
-----Rx Verify-----
ant 0
  65M
  2442 PER : 0%(0 ~ 10) Tester Send:1000 Frames@ -64dBm
----- Write DAC -----
2.4G Calibration data:
ANT0 OFDM DAC: 38 38 38 39 39 39 39 39 41 41 41 41 41
Write DAC OK
----- Close DUT -----
Close DUT OK
Test Time: 10s
----- PASS -----
Test.Cost=10
  
```

LogFile: The contents after format

```

CableLoss_2412_0 = 20
CableLoss_2442_0 = 20
CableLoss_2472_0 = 20
11G_54_PwrDAC_2422_0 = 14.75
11G_54_PwrDAC_2442_0 = 14.55
11G_54_PwrDAC_2462_0 = 14.51
11B_11_PwrRg_2442_0 = 17.28
11B_11_Evm_2442_0 = -24.10
11B_11_Freq_2442_0 = -2.43
11B_11_MaskPer_2442_0 = 0
GM.7.20_65_RxPer_2442_0 = 0
Test.Cost = 10
  
```