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GEA-8130A  
Ethernet Analyzer  
User's Manual  
V3.0



**DADI Telecom**

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In the whole test process, please comply with common safety prevent norms. If using the tester is not in accordance with this user manual, and the tester is damaged, DADI won't undertake any responsibility. Please be sure to follow the safety norms, lest cause bodily injury or tester damage.

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## **Warning**

### **Battery Charging**

Charging the battery must use the charger from the manufacturer. You can't use any unauthorized charger, lest cause tester damage or accident.

### **Battery Replacement**

Please use the manufacturer configured Li batteries. Do not use the tester in environment with inflammable or explosive liquid or steam. In this environment, it will be dangerous with any electrical instruments.

### **Clear to Operate in Flammable Air**

Do not use the tester in the environment in which flammable and explosive liquid and smoke. Dangers will happen if you use any device with electricity in that environment.

### **Open Rear Cover**

Unless you want to replace modules, please don't open rear cover or bottom cover. The replace must be operated by formal trained staff. There is high voltage in some areas inside the tester which will cause dangerous if it is mishandled.

### **LCD**

If the LCD is damaged and liquid outflows, please don't inhaled it into mouth or splash on skin. If the liquid is splashed into eye or mouth, please immediately rinse with water and go to the hospital. If the liquid is splashed on skin or clothes, please wipe with alcohol firstly, and then wash with soap and water. Don't touch the border of glass fragments, so as not to be scratched.

### **Explanation about using Optical**

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Forbid looking optical or the direction from which optical signals send directly. Optical signals can make the eyes damage, and make the eyes blind indeed.

Avoid to use optical fiber looping back to connect the sending and receiving port of optical model. If needing to loop back, you can connect supplied by in series in the receiving port of optical model, or use other devices to guarantee the optical power lower than -15dBm.

## Agreement on Description

For convenience and stressing of the description, we have agreed on some terms and icons within the range of this manual, about which you are sure to know.

[ ]: The bracket is used to identify the content or object on the interface or chassis. For example, the [OK] in “click on in the [OK] button” indicates the “OK” button displayed on the interface.



: Useful prompting message, which contributes to the efficient use of this system.



: Precautions, which indicate the common mistakes easily to be neglected by users.



: Warnings, if no attention is paid to these points, data loss or severe errors may be caused.

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# Chapter 1 General

GEA-8130A Ethernet Analyzer is a hand-held Ethernet tester, which can arrange Ethernet vlan and diagnose the trouble of Ethernet. It supports deployment of 10/100/1000M RJ45 and 100/1000M optical. It can monitor the state of network and also supports connectivity test, wire test, terminal emulation and so on in terminal mode and through mode. Moreover, It can be used for Traffic Test, RFC2544 Performance Test and Y.1564 Test to evaluate bandwidth, latency, frame loss and so on roundly.

## 1.1 Functions

### 1.1.1 Ethernet Testing

- The way to obtain IP address is flexible, including manual setting and automatic allocation from DHCP server.
- Generates and measures L2/L3/L4 traffic on up to 1G electrical Ethernet interfaces with C-VLAN, S-VLAN(QINQ), or MPLS Label #1 ~ Label #3. Up to 8 streams are supported for triple-play networks QoS verification.
- MPLS Test checks for correct policing and prioritization using the MPLS options;
- Y.1564 test supports service configuration test, 8 services at more, and service performance test.
- RFC2544 test supported, include throughput, latency, frame loss rate and back-to-back test.
- FTP/HTTP Download Speed Test: support download speed up to 1Gbps.
- High Speed Ping test is supported. High Speed Ping supports speed up to 1Gbps, it can be used as a simple performance test tool. Packet length and the frequency of sending packets is adjustable.
- Packet Capture is used to capture all kinds of network information to solve trouble of network.
- BERT: testing bit-error-rate for receiving and inserting error-bit for sending under circumstances of MAC layer, IP layer based on bit-error type filtering.
- IPDV Test checks the network performance for real-time services, for example, VIOP.
- Network Data Statistics shows information by classing all the frames that the tester sends and

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receives.

- Auto Test and Auto Restore realizes testing Traffic Test and RFC2544 Test automatically, and restoring the interrupted tasks abnormally.
- Auto Loopback and Auto Cooperation supported. This function can start one remote device 's Loopback or Cooperation through the local tester.
- PPPoE Test can test the popular Bandwidth dial function, and check problems.
- Wire Test includes testing length, order, short circuit, open circuit, cross fire and reversal of polarity.
- Wire Tracer is used to find the needed wire among wiring.
- PoE Test checks whether the devices in network (for example, router, and exchange board) can supply electricity for terminal device. Furthermore, the function will test whether the terminal device is the PoE power receiving equipment and transferring electricity to the terminal device.
- Port Blind will be used to test to which port of router, exchange board or concentrator wire is connected.
- Port Identify can identify the service type connected: Ethernet port, Telephone system, or Token-ring.
- Netscan is the function of discovering devices in network real-time and recognizing service type.
- Ping supports the long ping frame send, and multiple IP addresses at the same time.
- Traceroute can trace the IP addresses of all the gateways and routers between GEA-8130A and the special host.
- Application layer Performance Test is used to test response time of application layer server, max time, min time, average time and count of no response.
- SNMP Query will query information of network devices according to SNMP protocol, including basic information, interface information and information about service.
- Net Health is checked to show network state through analyzing net data.
- Net Problem can discover network problems real-time.
- Complete Data Management is convenient for users to save, delete and copy files.

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## 1.2 Characteristics

- Small and exquisite: hand-held, small size, light weight;
- Easy and simple to handle, color and high definition touch screen, graphical user interface;
- Powerful battery: high-capacity lithium battery, long duration;
- Supply abundant net tool, for example, connectivity test and wire test;
- Strong performance tests check the network state roundly, including Traffic Test, RFC2544 Test, Y.1564 Test and Bert Test;
- Local area network Test, Netscan, Terminal emulation, Nethealth, Netproblems, can make users to know the network state in-depth and discover problems real-time;
- Support various test mode, Terminal Mode, Through Mode, Loopback, Cooperation, Auto Loopback and Auto Cooperation;
- Support Auto Test;
- Support multiple port and protocol, 10/100/1000M RJ45, 100/1000M optical, DIX and IEEE 802.3 SNAP protocol;
- Good compatibility. Support to test with other series products of DADI.

## Chapter 2 Inspection

It's absolutely necessary for you to have some inspections before unpacking to check the set. In this chapter, we would like to help you in a rough idea of the initial work status of the set.

### 2.1 Unpack the Set

Before unpacking, please check whether there is any damage in the carton and the bag. In case that bag damaged or articles incomplete or the set cannot achieve function tests all the same, please contact us immediately.

### 2.2 Accessories and Options

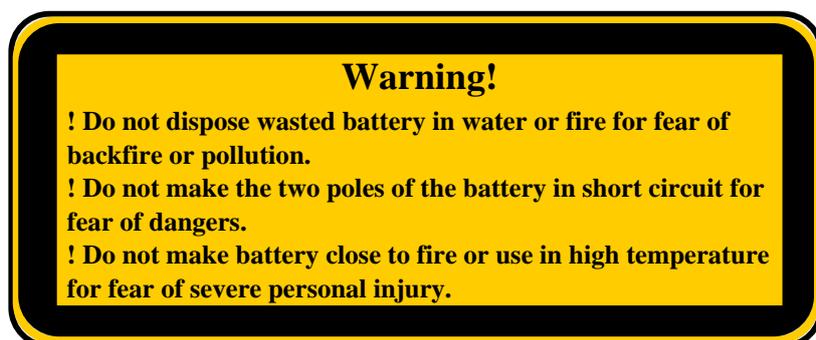
Please check the accessories according to the packing list. If something is wrong or missed, please inform us immediately.

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## 2.3 Power Supply

The set supports two power supply modes, DC and battery, with a built-in large capacity rechargeable lithium battery. The battery supports 6-hour long consecutive operation if being fully charged.

When using external power supply, the battery will charge automatically, and the battery capacity will be shown on the right top corner of LCD of the set at any moment.



Warning of Power Supply

## Chapter 3 Appearance and Interfaces

### 3.1 Appearance



Appearance

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## 3.2 Interface

1. Electrical ports: electrical ports adopt RJ45 port, which are located at the top of equipment (the right side is port 1; the left side is Port 2) and support electrical packages 10/100/1000M.
2. Optical port: optical port adopts SFP, which is located at the top of the equipment and supports 100/1000M.
3. Power: this equipment adopts external 15V/3A DC adaptor power, which is located on the left side of the equipment.
4. USB: it is used for the tested reports copy, mouse, keyboards, system upgrading and so on, which is located on the right side of the equipment. The USB port is shown in.
5. System netcard: RJ45 interface, match relevant parameters in [**System Setting**], it is located on the right side of the equipment.

## 3.3 Keyboard

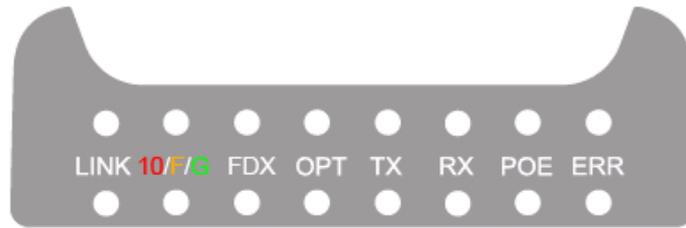
1. [**POWER**]: Power On/Off;
2. [**▶/■**]: Start/Stop testing;
3. [**HOME**]: return to main.



Keyboard

## 3.4 LED Indicators

The LED indicators are designed to show the corresponding port or link status, as is shown in the following figure.



### LED Indicators

1. **[LINK]**: Link Activation indicator.
2. **[10/F/G]**: Link Rate indicator. **RED** indicates 10Mbps, **YELLOW** indicates 100Mbps and **GREEN** indicates 1000Mbps.
3. **[FDX]**: Full Duplex indicator. When the light is on, the link is in Full Duplex.
4. **[OPT]**: Optical port indicator. When the light is on, it is optical port, or else it is electrical port.
5. **[TX]**: Sending data indicator. When the light is on, data is send.
6. **[RX]**: Receiving data indicator. When the light is on, there is receiving data.
7. **[POE]**: PoE indicator. Under terminal mode, port 1 shows POE power supply equipment; under put-through mode, port1 shows power supply equipment, port2 shows power receiving equipment.
8. **[ERR]**: Error data indicator. When the light is on, the tester receives error data.
9. **[POWER]**: It is located at the right side of the indicator in the above picture. When an external power used, it lights on.

## Chapter 4 Installation and Initial Operation

### 4.1 Appearance and Interface Check

1. Unpack the package and check whether the equipment is worn and whether the structure is kept securely. If there is any question, please contact our customer service department.

- 
2. Check whether the interfaces have been configured fully and kept in clean condition. Additionally, check whether the test wire/fiber has been provided as specified in the packing list.

## 4.2 Self-test

1. As is shown in the following figure, connect electrical port and optical port of port1 and port2.



2. Plug in the external power adapter and push down the key **[Power]**. At this time, the **[PWR]** Indicator should be ON; if not, please unplug the power adapter immediately and contact our company's technicians.
3. When the system is starting, the screen is in the black status. After waiting for about 20 seconds, the system starts up and carries out hardware settings, following by the automatic start-up of the software.
4. Press **[Start]** menu and enter into **[Port Para. Set]**, set dual ports as the electrical port with the rate of 10M. Click **[OK]** to complete the setting. Now the **[10/F/G]** indicator is red.
5. Enter into **[Traffic Tx Para. Set]**, select 100% traffic and single stream. Testing layer is **[Mac layer]**, and select default BERT pattern **[2<sup>7</sup> - 1]**. Ensure the setting.
6. Enter into [Traffic Test] function and press **[Send]** to start sending traffic. The normal

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traffic is 10Mbps. The receiving traffic statistics function is the same as the sending traffic, the error code digit and error code rate are 0.

7. Return to **[Traffic]** interface, stop sending traffic.
8. Configure port as 100M electrical port, repeat above steps 5~7.
9. Configure port as 1000M electrical port, repeat above steps 5~7.
10. Configure port as 100M optical port, repeat above steps 5~7.
11. Configure port as 1000M optical port, repeat above steps 5~7.
12. If above functions are normal, the self-test is passed.

## **Chapter 5    Operation Reference**

### **5.1    Main User-Interface Navigation**

Main user-interface lays out the basic information for user operation, as is shown in figure 5.1.1.

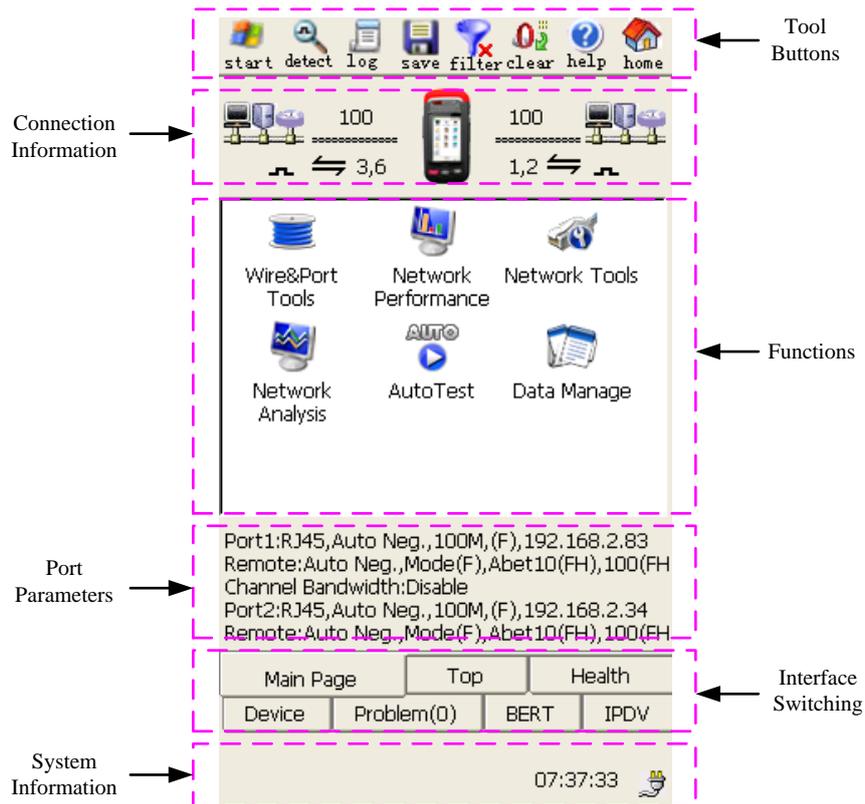


Figure 5.1.1 Main User-Interface

Main User-interface contains: Tool Buttons, Connection Information, Functions, Port Parameters, Interface Switching, System Information and so on.

### 5.1.1 Tool Buttons

The tool buttons at the top of the main interface contain: “start”, “detect”, “log”, “save”, “filter”, “clear”, “help” and “home” ( or “back” ) from left to right.

#### 5.1.1.1 Start menu

Click  in the main interface, the start menu will pop up. As is shown in figure 5.1.2.

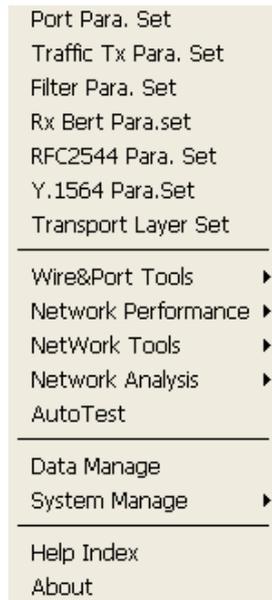


Figure 5.1.2 Start Menu

Start menu is divided into 4 parts: parameter settings, functions test, Management and others.

1. Parameter settings: the items include port setting, traffic sending setting, filter setting, bert setting, RFC2544 setting, Y1564 setting and transmission layer setting;
2. Functions test: this part has 5 tests: physical test, performance test, network tool, cooperation test, and auto tools, of which every item includes corresponding secondary menu and make corresponding testing functions;
3. Management: this part includes data management and system management. System management has 7 items: System Set, MAC Address, Screen Adjust, Factory Set, System Upgrade, Remote Control and Auth Manage.
4. Others: others includes help index and about.

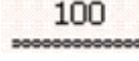
### 5.1.1.2 Other buttons

1. Detect () : check the information of port connection state and characteristics. See 5.1.2.2;
2. Log () :when you press this button, it will show all the testing logs from the boot-strap and does not appear until bouncing;

- 
3. Save (): save the test configuration, statistics information or testing result of present page;
  4. Filter (): check and set receiving filtration. If some filtrations are used, it shows . Otherwise, it shows ;
  5. Clear (): clear whole statistics or testing function as zero and this needs to be assured;
  6. Help (): help files will pop up;
  7. Return (): when it returns to main interface from other interface and is located in main interface, it shows .

### 5.1.2 Connection information

Port connection information shows actual physical connection information of dual ports and device's working mode:

	Corresponding port has already connected to network		The present connection rate is 100M
	The present connection is full duplex		The present connection is half duplex
1, 2	Cable's receiving pairs are 1, 2	3, 6	Cable's receiving pairs are 3, 6
	Normal level, normal polarity		Normal level, reverse polarity
	Low level, normal polarity		Low level, reverse polarity
	It works under terminal mode		It works under put-through mode (some functions will be prohibited)
	Test the port's connection information again after click		

#### 5.1.2.1 Working Mode

GEA-8130A supports two working modes: terminal mode and put-through mode. Terminal mode can realize all testing functions except PoE test; put-through mode can realize statistics function, packet capture and PoE test. Click above working mode icon to select working mode, as is shown

in figure 5.1.3:

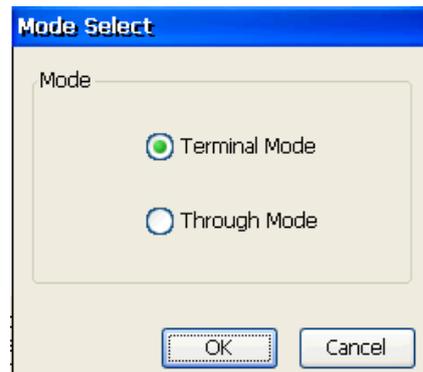


Figure 5.1..3 Mode Selections

Each working mode has their port setting. You can set port setting in **【Start】** → **【Port Para. Set】** .

### 5.1.2.2 Detect

When port connection changes, you can click  and automatically test port's connection information: connection rate, duplex type, receiving pairs, level and polarity etc.



This module shows the link's connection information, so link duplex mode may not match with port duplex mode.

### 5.1.3 Functions

Enter into detailed function interface by clicking interface icons. GEA-8130A supports the following functions: Wire&Port, Network Performance, Network Tools, Network Analysis, Auto Test and Data Manage.

Wire&Port can test the physical characteristics of net, which include Wire Length test, Wire Order test, Port Blind, Wire Tracer, PoE test and Port Identify.

Network Performance tests supply the performance of net. It include traffic test, RFC2544, Y.1564 test, Cooperation, Loopback, Download Speed, High Speed and Server.

Network Tools are tools that describe the status of network. They are Ping Test, TraceRoute, WEB

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browsing, PPPoE.

Network Analysis includes NetScan, Packet Capture and SNMP.

Auto Test is a tool used to test some functions automatically.

Data Manager is a tool that users delete, copy or add reports or other files.

In addition, the tab at the end of the interface is whole statistics function: statistics, health, device, problem, bert, IPDV.

#### 5.1.4 Port Parameter

Display current working parameter of port, including port settings of Port1 and Port 2, such as optical port/electrical port, rate(10/100/1000M), working mode (full duplex/half duplex/auto-negotiation), IP address etc. At the same time, GEA-8130A will check the status of remote port, such as negotiation way, working mode and supported port rate and working mode. 

- 1) The auto-negotiation mode of the local tester supports to test remote working status. When it is manual, it doesn't support testing;
- 2) When working mode of the remote tester is manual, it can't test working mode and port rate of remote one;
- 3) **【Unabet】** doesn't mean to support far-end test, **【Unknown】** doesn't mean to identify far-end status, **【H】** means half duplex, **【F】** means full duplex.

#### 5.1.5 Interface Switching

It is used for the switching of different testing interfaces, including home (or some detailed test function), statistics, health, device, problem, bert, IPDV etc.

The six functions, statistics (network statistics), health (network health), device (device identification), problem (problem discovery), bert, IPDV, are always in the statistics monitoring status during the operation period.

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### 5.1.6 System Information

Display USB storage, PPPoE status, remote control state, Auto Cooperation, Auto Loopback testing state, optical power test, Realtime report, system time, battery state and so on:

1. USB Storage (): if USB storage is detected,  will be shown;
2. PPPoE Status (): if PPPoE is linked successfully,  will be shown;
3. Remote control state (): it shows remote control function has started and control end has connected to the instrument;
4. Optical power test (): it will show as the interface type selects optical fiber. Click it, sending power interface and receiving power interface of Port1、Port2 pop up, when you click other space, they will disappear;
5. Auto Cooperation (): This icon means that auto cooperation has started, and shows the information of the connected other one by clicking it.
6. Auto Loopback (): This icon means that auto loopback has started, and shows the information of the connected other one by clicking it.
7. Realtime report (): This icon means that real time traffic data saving has started, and shows the information of sampling data saving parameters by clicking it.
8. Screen Capture (): save screen capture to report;
9. Battery Status (/ ): when the battery is used, it's capacity will be shown; and if power-supply adapter is used, charging status will be shown;
10. System Time: system time is shown in 24-hour system, and can be modified in "System Setting".

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## 5.2 Port Setting

Port setting is used for setting port parameters of Port1 and Port 2. Two layers tab pages respectively select ports and parameter setting. ports include Port 1 and Port 2. Parameters of ports include parameter summary, physical parameter, network parameter, VLAN and MPLS in the terminal mode. And in through mode parameters only relate to physical parameters and SVLAN-TPID.

### 5.2.1 Parameters Summary

Parameters Summary is used to browser parameters of physical parameter, network parameter, VLAN and MPLS, as shown as figure 5.2.1.



Figure 5.2.1 Parameters Summary interface

### 5.2.2 Physical Parameters

Physical parameter setting is shown in figure 5.2.2.

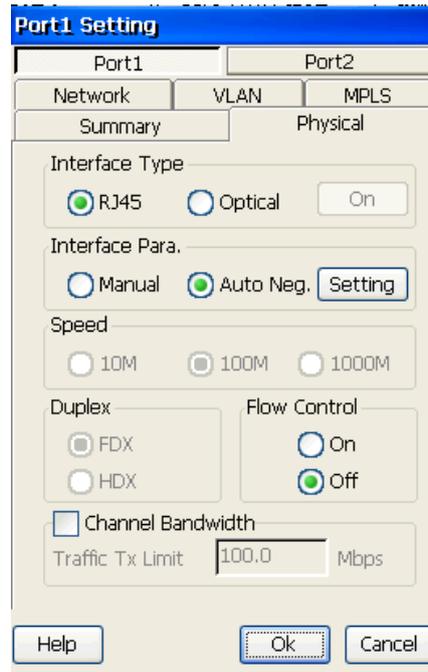


Figure 5.2.2 Physical Parameters interface

1. **[Interface Type]**: to set the interface type, supporting “**RJ45**” and “**Optical**”. When “**Optical**” is selected, button “**On/Off**” can control optical maser on or off.
2. **[Interface Para. ]**: to set the physical configuration way, supporting “**Manual**” and “**Auto Negotiation**”.
3. **[Speed]**: to set velocity of the interface, and for the electricity port, effective with 10/100/100M choice in “**Manual**” mode and ineffective in “**Auto Negotiation**” mode. For optical port, 100/1000M choice is effective.
4. **[Duplex]**: to set the duplex mode, and for the electricity port, effective with both “**Full Duplex**” and “**Half Duplex**” in “**Manual**” mode, and ineffective in “**Auto Negotiation**” or for optical port.
5. **[Flow Control]**: to enable or disable the flow control, disabled in default.
6. **[Channel Bandwidth]**: to set the bandwidth of the channel by setting Traffic Tx Limit, range:0.1M~Port Speed, accuracy: 0.1M.



- 1) In optical port, negotiation mode (manual or auto negotiation) and rate are accordance with the connected end.
- 2) Only “Full-Duplex” mode is supported for the electricity port in 1000Mbps.



**When optical port starts, please don't look at Tx illuminating port of SFP steadily so as to avoid hurting eyes.**

### 5.2.3 Network Parameters

To set local IP address, gateway, subnet mask, multiple IP information and DNS. Moreover, simulated source IP addresses can also be set. Network parameter setting is shown as in figure 5.2.3.

The screenshot shows the 'Port1 Setting' dialog box. It has a blue title bar and several tabs: 'Port1' (selected), 'Port2', 'Summary', 'Physical', 'Network', 'VLAN', and 'MPLS'. The 'IP Config' section is expanded, showing two radio buttons: 'Manual' (selected) and 'DHCP'. Below these are three text input fields: 'IP Addr.' with the value '192.168.2.83', 'Subnet Mask' with '255.255.255.0', and 'Gateway' with '192.168.2.2'. A pattern '[192].[168].[2].[0~255]' is shown below the gateway field. Below the IP Config section, there is an 'Enable' checkbox (unchecked), and another set of radio buttons for 'Manual' and 'DHCP'. A 'DNS Server' field contains the value '192.168.1.254'. At the bottom, there are three buttons: 'Help', 'Ok', and 'Cancel'.

Figure 5.2.3 Network Parameters Configuration

1. **[IP Config]:** to select manual setting or DHCP to configure IP address;

2. **[IP Addr.]**: to set local IP address, and the format is as“192.168.xxx.xxx”; click the edit box, the input keyboard will pop up;
3. **[Subnet Mask]**: to Set subnet mask of IP address;
4. **[Gateway]**: to set the gateway of the network, and the available gateway range will be shown, which is generated based on “**IP Addr.**” and “**Subnet Mask**”;
5. **[DNS Server]**: To set the configuration way of domain server, supporting manual or DHCP. If you set static IP address manually, DNS server can only be set in manual. If you acquire dynamic IP address in DHCP way, DNS server configuration can be set in both DHCP and manual way.
6. **[DNS Server]**: To set the address of DNS Server only in manual mode.
7. **[...]**: To set multiple simulated IP addresses, 8 at most. As shown as figure 5.2.4 and figure 5.2.5.

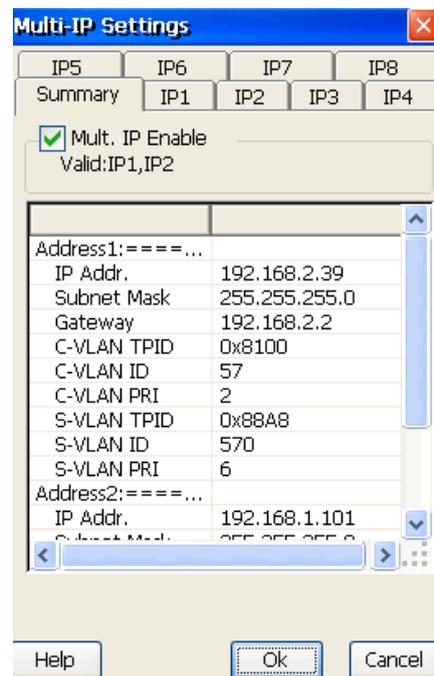


Figure 5.2.4 Port Setting-Multi-IP Settings summary

11. **[Multi-IP Settings-Mult. IP Enable]**: To enable or disable Multi-IP simulated.

- 
12. [Multi-IP Settings-Valid]: To show information of simulated IP.
  13. [Multi-IP Settings-Address\*]: To show IP address, subnet mask, gateway and vlan of simulated IP.

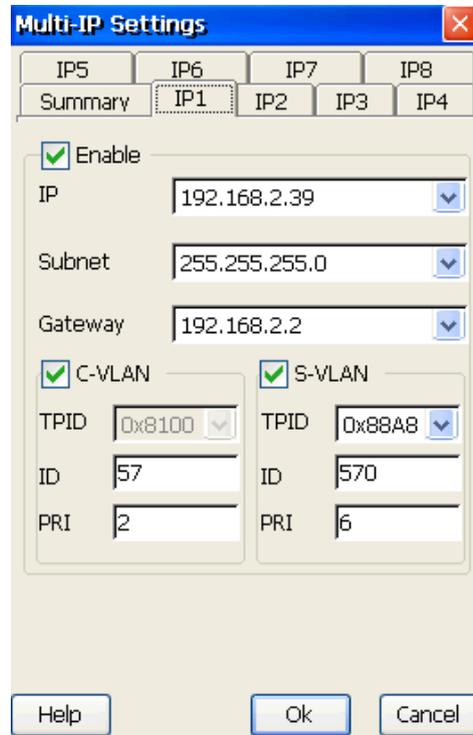


Figure 5.2.5 Port Setting-Multi-IP Settings IP1

14. [Multi-IP Settings-IP\* Enable]: To enable simulated IP\*.
15. [Multi-IP Settings-IP\* IP]: To set simulated IP address.
16. [Multi-IP Settings-IP\* Subnet]: To set simulated IP subnet mask.
17. [Multi-IP Settings-IP\* Gateway]: To set simulated IP gateway.
18. [Multi-IP Settings-IP\* C-VLAN]: To enable simulated IP with C-VLAN.
19. [Multi-IP Settings-IP\* S-VLAN]: To enable simulated IP with S-VLAN.
20. [Multi-IP Settings-IP\* TPID]: To set TPID of VLAN.
21. [Multi-IP Settings-IP\* ID]: To set ID of VLAN.

---

22. [Multi-IP Settings-IP\* PRI]: To set PRI of VLAN.



- 1) Simulated multi-IP can realize simulating multiple source IP addresses to analyze and statistic data by sending or receiving packets with different IP.
- 2) During the process of multi-stream or Y.1564 testing, you can set 8 streams or source and destination IP address of 8 services. The function of Multi-IP Settings makes the tester receive data from 8 IP at the same time.

### 5.2.4 VLAN

VLAN parameters setting is shown as in figure 5.2.6.

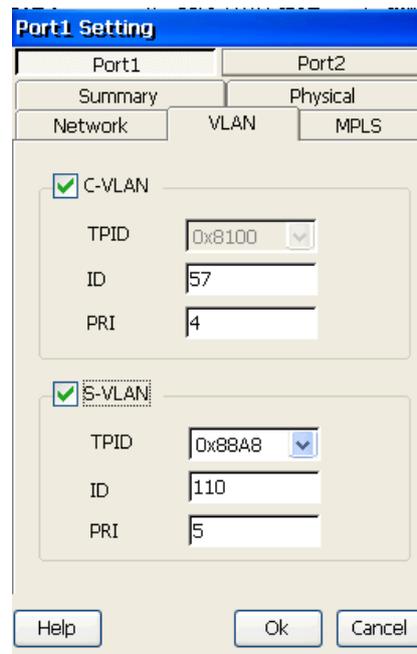


Figure 5.2.6 VLAN Parameters Configuration

1. [C-VLAN]: To enable C-VLAN or not. C-VLAN TPID and ID value(range: 0~4095) and Priority (range: 0~7) can be set.
2. [S-VLAN]: To enable S-VLAN or not. S-VLAN TPID and ID value (range: 0~4095) and Priority (range: 0~7) can be set.



When[C-VLAN] or [S-VLAN(or called QINQ)] is enabled, the frames under following test will contain VLAN tag:

1. **Network Tools:** such as “PING”, “Netscan”, “SNMP”, “App. Server Performance”, “Trace Route”, “Download Speed”, etc.
2. **Traffic Generation:** For single stream, Tx-frames will contain VLAN information, and for multi-stream, VLAN tag level, TPID, ID and Priority of each stream can be set before VLAN frames work.
3. **Traffic Measurement:** Rx statistics will analysis received frames according to the C-VLAN and S-VLAN TPID value.
4. **RFC2544 Test.**

### 5.2.5 MPLS

MPLS parameters interface is shown as in figure 5.2.7.

The screenshot shows the 'Port1 Setting' dialog box with the 'MPLS' tab selected. It features three sections for MPLS configuration, each with a checked checkbox and fields for Label, S, CoS, and TTL. The first two sections have S=0 and TTL=128. The third section has S=1 and TTL=128. There are also 'Unicast' and 'Multicast' radio buttons, with 'Unicast' selected. At the bottom are 'Help', 'Ok', and 'Cancel' buttons.

Figure 5.2.7 MPLS Parameters Configuration

- 
1. **[MPLS Mode]:** Support “Unicast” and “Multicast”;
  2. **[MPLS#1,#2,#3]:** To set each level of MPLS, the parameters can be set under running but just effective on Rx;
  3. **[Label]:** Label value of MPLS, range: 0~1048575;
  4. **[S]:** Disabled, just to display the status of each MPLS layer;“1”is shown for the last layer, and “0”is shown for others;
  5. **[Cos]:** Service quality value of MPLS, range: 0~7;
  6. **[TTL]:** TTL(survival time) value of MPLS Header, range: 0~255.



When **[MPLS#1,#2,#3]** is enabled, the frames under following tests will contain MPLS tags:

1. **Network Tools:** such as “PING”, “Netscan”, ”SNMP”, “App. Server Performance”, “Traceroute”, “Download Speed”, etc.
2. **Traffic Generation:** For Single-stream, Tx-frames will contain MPLS information, and for multi-stream , parameters of each stream can be set before MPLS frames work.
3. **RFC2544 Test.**

## 5.3 Sending Setting

“Send Parameters” is clicked into setting box which is used for setting parameters of sending stream (following Tx-stream for short), including 3 pages as “Summary”, “Traffic”, “Stream Para” and “Test Duration”.

### 5.3.1 Summary

“Summary” page is used to display parameters of Tx-stream, as is shown in figure 5.3.1:

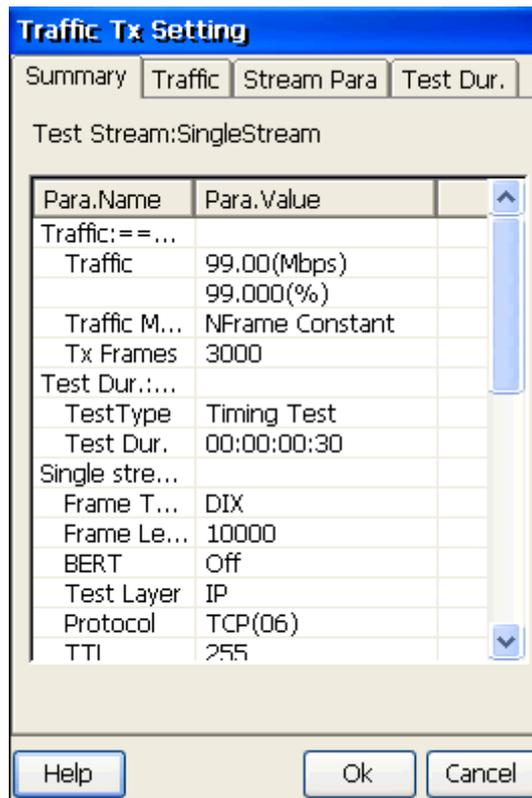


Figure 5.3.1 Sending Setting-Summary

### 5.3.2 Traffic

“**Traffic**” page is used for setting mode and rate parameters of Tx-stream, as is shown in figure 5.3.2:

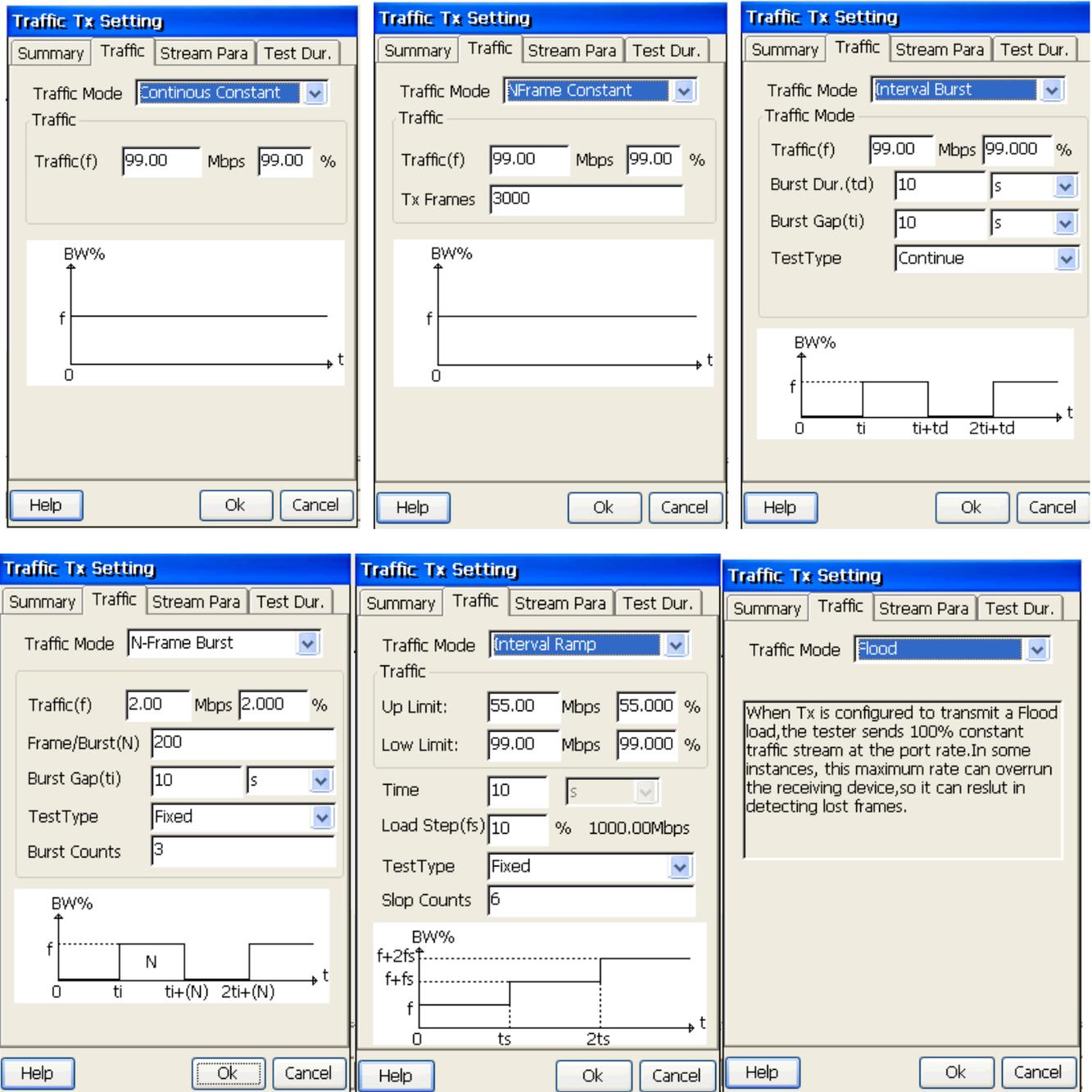


Figure 5.3.2 Sending Setting-Traffic Parameters

### 5.3.2.1 Traffic

To set Tx-rate, including 4 options mode: **[Flood]**, **[Traffic]**, **[Up Limit]** and **[LowLimit]** selected.

1. **[Flood]**: to limit Tx-stream velocity to port rate in Flood mode;

- 
2. **[Traffic]**: to customize Tx-rate, Range: 0.1Mbps~channel bandwidth;
  3. **[Up Limit]**: to limit Tx-stream velocity up to some input velocity in Ramp mode;
  4. **[Low Limit]**: to limit Tx-stream velocity at lowest in Ramp mode.

### 5.3.2.2 Traffic Mode

To set Tx-stream mode, including 6 options:.

1. **[Continuous Constant]**: to generate stream in “constant ”mode;
2. **[NFrame Constant]**: to generate stream in “constant ”mode;
3. **[Interval Burst]**: to generate stream in “burst” mode, in which there are 2 parameters: “Burst Dur.(td)” and “Burst Gap(ti)””; for each one, the max rate is the “limited ”or “specified ” rate, and the min rate is 0Mbps, range: 1~3600 (unit: sec or ms). Two test modes, “Continuous” and “Fixed” (range: 1~100000), can be selected;
4. **[NFrame Burst]**: to generate stream in “burst” mode, with burst frames as burst unit. “Frames/ Burst” is sending frames, range, 1~1000000000. “Burst Gap(ti)” is the time for sending next frame, range: 1~3600 (unit: sec or ms) .Two test modes, “Continuous” and “Fixed” (range: 1~100000), can be selected;
5. **[Interval Ramp]**: to generate stream in “ramp” mode, in which there are 2 parameters: “Time Step (ts)” (range: 1~800, unit: s)and “Traffic Step(fs)” (range: 1~800, accuracy: 1%) ; for the latter , the min rate is the “Low Limit ”rate, and the max rate is the “Up Limit”. Two test modes, “Continuous” and “Fixed” (range: 1~100000), can be selected;
6. **[Flood]**: to generate stream in “Flood” mode, at 100% port rate.

### 5.3.3 Stream Para

“Stream Para” page is used for setting parameters of Tx-stream, as is shown in figure 5.3.3.

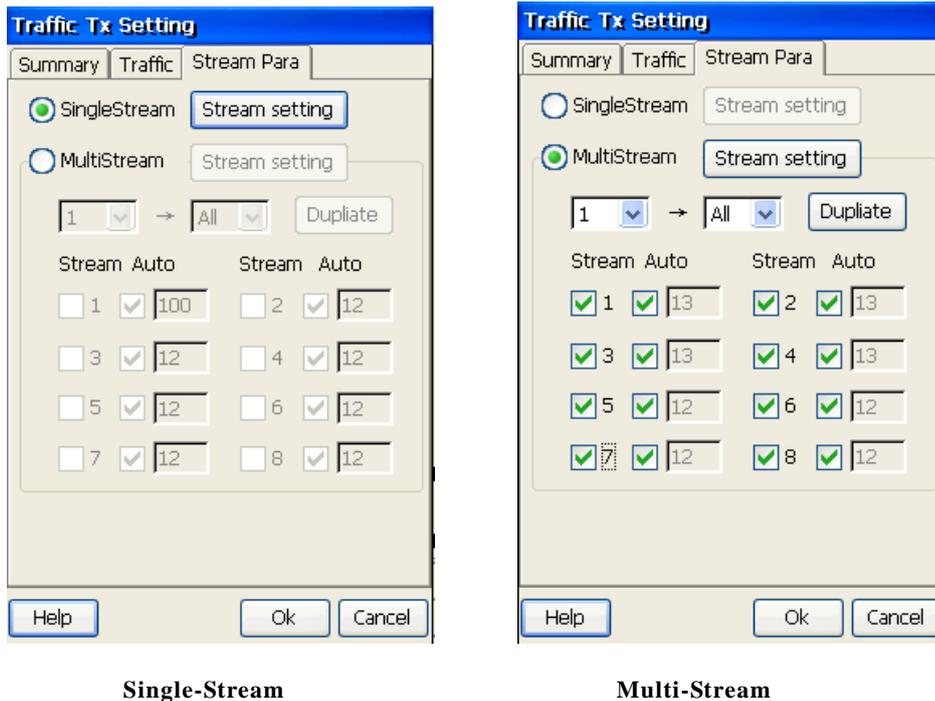
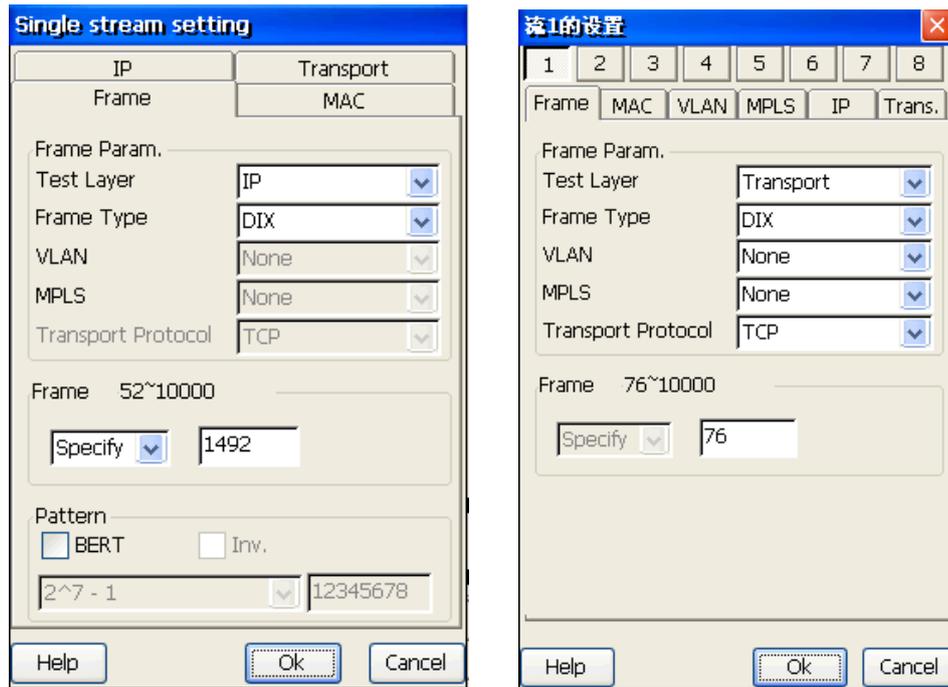


Figure 5.3.3 Modification of Tx-Stream

Tester can send single stream or multiple streams. If you select single stream, click **[Setting]** and modify single stream setting. If you select multiple stream, select the stream number you need and corresponding stream percentage, click **[Setting]** and modify multiple stream setting. Stream setting includes: “**Frame**”, “**VLAN (multi-stream)**”, “**MPLS (multi-stream)**”, “**MAC**”, “**IP**” and “**Trans.**”.

### 5.3.3.1 Frame

In single-stream mode, Frame setting includes: “**Test Layer**”, “**Frame Type**”, “**Transport Protocol**”, “**Frame Length**” and “**BERT Pattern**”. “**VLAN**” and “**MPLS**” is disabled just for display. In multi-stream mode, user can set the following items: “**Test Layer**”, “**Frame Type**”, “**VLAN**”, “**MPLS**”, “**Transport Protocol**” and “**Frame Length**”, as is shown in figure 5.3.4.



**Single-Stream**

**Multi-Stream**

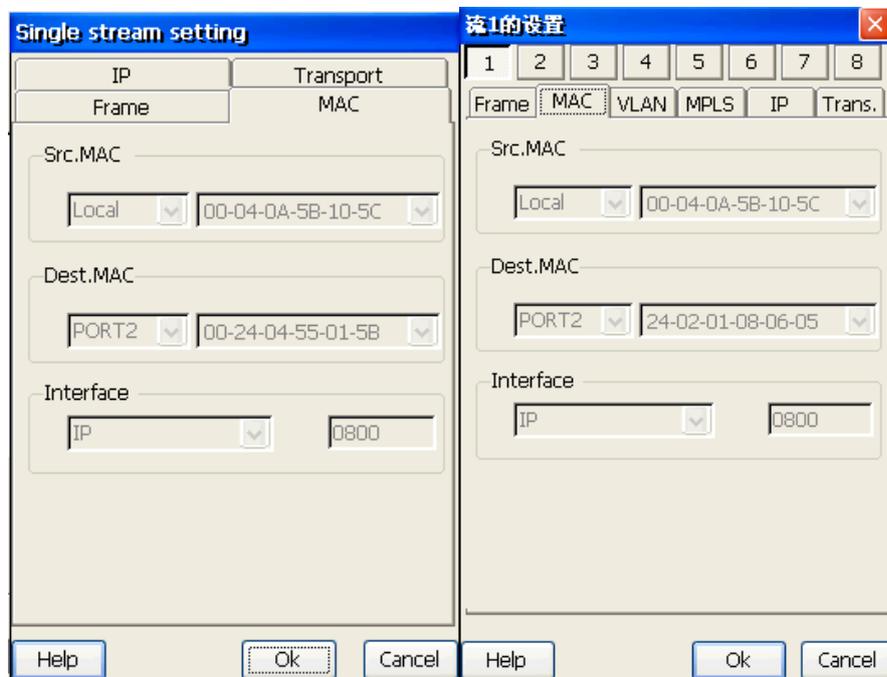
Figure 5.3.4 Sending Setting-Frame Configuration

1. **[Test Layer]**: to set the test layer of Tx-stream, including Physical layer (Only for single-stream), MAC layer, IP layer, Transport layer.
2. **[Frame Type]**: to set the frame type of Tx-stream, with DIX and 802.3 SNAP options and disabled under physical layer test.
3. **[VLAN]**: to set VLAN level of Tx-stream in multi-stream mode, with None, C-VLAN and S-VLAN for selection, disabled and only for shown in single-stream mode.
4. **[MPLS]**: to set MPLS level of Tx-stream in multi-stream mode, with None, MPLS#1,MPLS#2 and MPLS#3 for selection, disabled and only for shown in single-stream mode.
5. **[Transport Protocol]**: to set the protocol of TCP layer, with TCP and UDP for selection.

6. **[Frame Length]**: to set the length of Tx-frames, with “Specify”(to set frame length) and “Random” (to set frame length area) for selection in Single-stream mode, except for that frame length default as 1492 bytes under physical layer test with Pattern “CRPAT” cannot be modified; if Pattern select “CJPAT”, the frame length default to 1508 bytes, and if Pattern select “CSPAT”, the frame length default to 1516 bytes; and with only “Specify” in multi-stream mode.
7. **[Pattern]**: to set whether error-bit is inserted in the Tx-frames and only effective under single-stream, for which test layer must be physical, MAC or IP. Under physical layer testing, “CRPAT”, “CJPAT” or “CSPAT” pattern is for selection. Under MAC or IP layer testing, pattern can be set to: “2^7-1”, “2^9-1”, “2^11-1”, “2^15-1”, “2^20-1”, “2^23-1”, “2^31-1”, “All 1’s”, “All 0’s” or “Specify”. If “Inv” is checked on, corresponding bit-complementary pattern is adopted.

### 5.3.3.2 MAC Layer

Used for setting MAC layer parameters of Tx-stream, and only effective on MAC layer test level, as is shown in figure 5.3.5.



Single-Stream

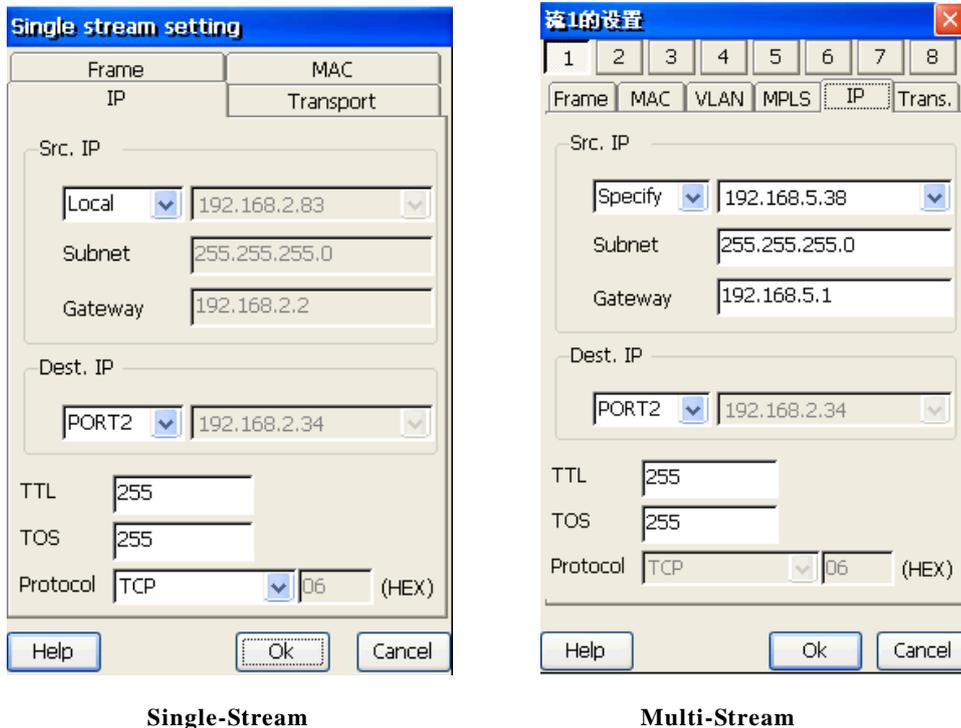
Multi-Stream

Figure 5.3.5 Sending Setting-MAC Layer Configuration

1. **[Src. MAC]:** to set source MAC address of producing stream, select host's port 1 address or specified MAC address
2. **[Dest. MAC]:** to set destination MAC address of producing stream, select specified MAC address.
3. **[Protocol Type]:** to set the protocol type of MAC frames , including “IP”, “IPX”, “ARP”, “RARP”, “Banyan”, “DECnet”, “Apple Talk”, “DADI” and “Specify(HEX)” in single-stream mode, and supporting input of any 2-byte protocol, in multi-stream mode, disabled and only shown.

### 5.3.3.3 IP Layer

Used for setting IP layer parameters of Tx-stream, and only effective on IP layer test level, as shown in figure 5.3.6.



Single-Stream

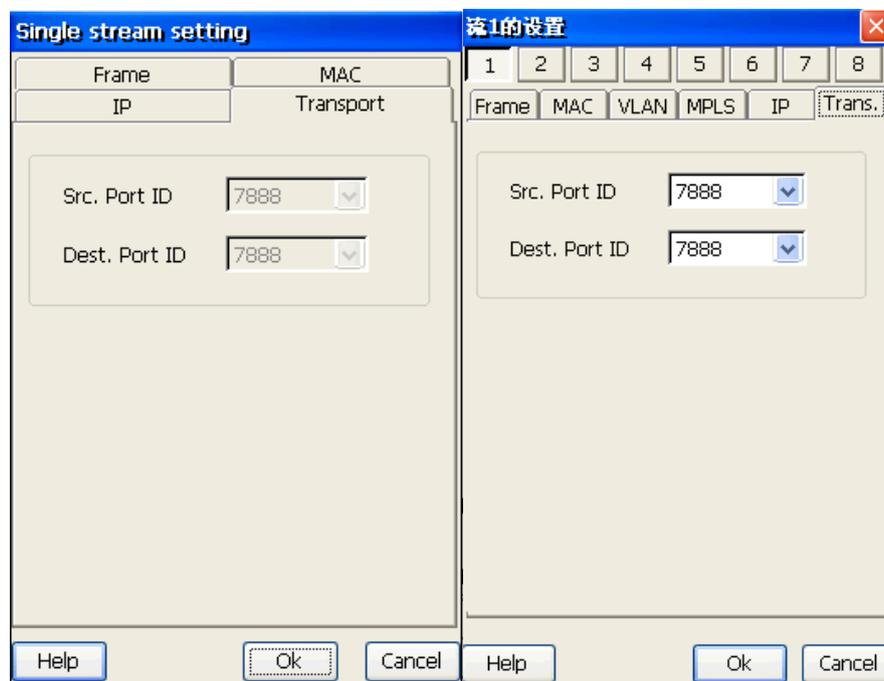
Multi-Stream

Figure 5.3.6 Sending Setting-IP Layer Configuration

1. **[Src. IP]:** to set source IP address of generated stream, with 2 choice: “ Local ”or “Specify”, that is , the stream can simulate frames with any IP.
2. **[Subnet]:** to set source subnet of generated stream.
3. **[Gateway]:** to set source gateway of generated stream.
4. **[Dest. IP]:** to set destination IP address of generated stream, with compulsory “Specify”.
5. **[TTL]:** to set TTL value of IP layer, the range is 1~255.
6. **[TOS]:** to set TOS value of IP layer, the range is 1~255.
7. **[Protocol]:** to set the protocol value of IP Layer Tx-stream, with “TCP”, “UDP”, “ DADI ”and “Specify(HEX)” in single-stream mode, supporting user input of any 1-byte protocol, in multi-stream mode, only for shown with default protocol.

### 5.3.3.4 Transport

Used for setting TCP layer parameters of Tx-stream, only effective on transport test layer, as is shown in figure 5.3.7.



**Single-Stream**

**Multi-Stream**

Figure 5.3.7 Sending Setting-Transport Layer Configuration

1. **[Src. Port ID]**: to set the source port number for Transport layer Tx-stream.
2. **[Dest. Port ID]**: to set the destination port number for Transport layer Tx-stream.

### 5.3.3.5 VLAN

Used for setting VLAN parameters of Tx-stream, only effective in multi-stream mode, as is shown in figure 5.3.8.

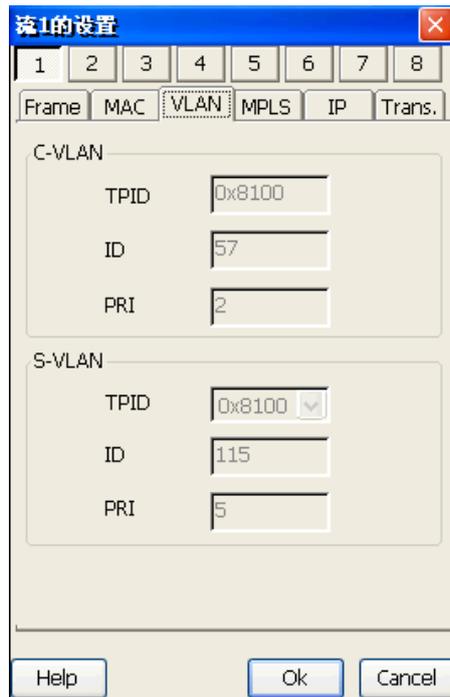


Figure 5.3.8 Sending Setting-VLAN Configuration

1. **[C-VLAN]**: When C-VLAN is chosen on VLAN test level, parameters can be set: ID value (range: 0~4095) , Priority (range: 0~7);
2. **[S-VLAN]**: When S-VLAN is chosen on VLAN test level, parameters can be set: TPID is one among 0x8100, 0x9100, 0x9200, 0x88A8 and 0x9300, ID value (range: 0~4095), Priority (range: 0~7).

### 5.3.3.6 MPLS

Used for setting MPLS parameters of Tx-stream, only effective in multi-stream mode

and should be on IP or TCP test layer, as is shown in figure 5.3.9.

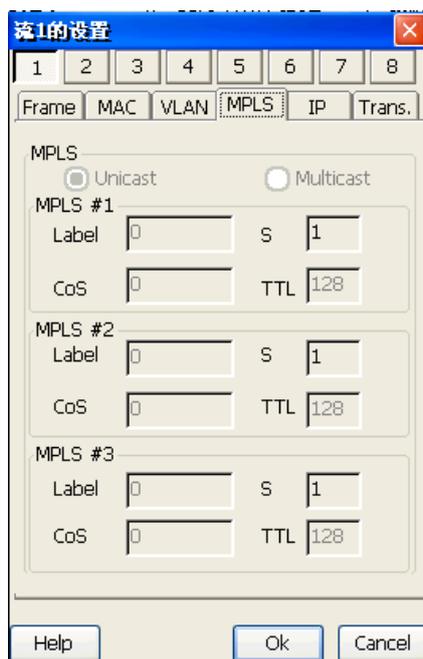


Figure 5.3.9 Sending Setting-MPLS Configuration

1. **[MPLS Mode]**: with “Unicast ”and “Multicast” options;
2. **[Label]**: Label value of MPLS, range : 0~1048575;
3. **[S]**: Disabled, just for display the status of each MPLS layer;“1”is shown for the last layer, and “0”is shown for others;
4. **[CoS]**: Service quality value of MPLS, range: 0~7;
5. **[TTL]**: TTL(survival time) value of MPLS Header, range: 0~255.

### 5.3.4 Test Duration

To set [Test Type] and [Test Dur.], as shown in figure 5.3.10.

[Test Type]: including “Continue Test” and “Timing Test”;

[Test Dur.]: When test type is Timing Test, test duration needs to be set, and format is “Day:Hour:Minute:Sencond”. Range is 00:00:00:01~99:23:59:59.

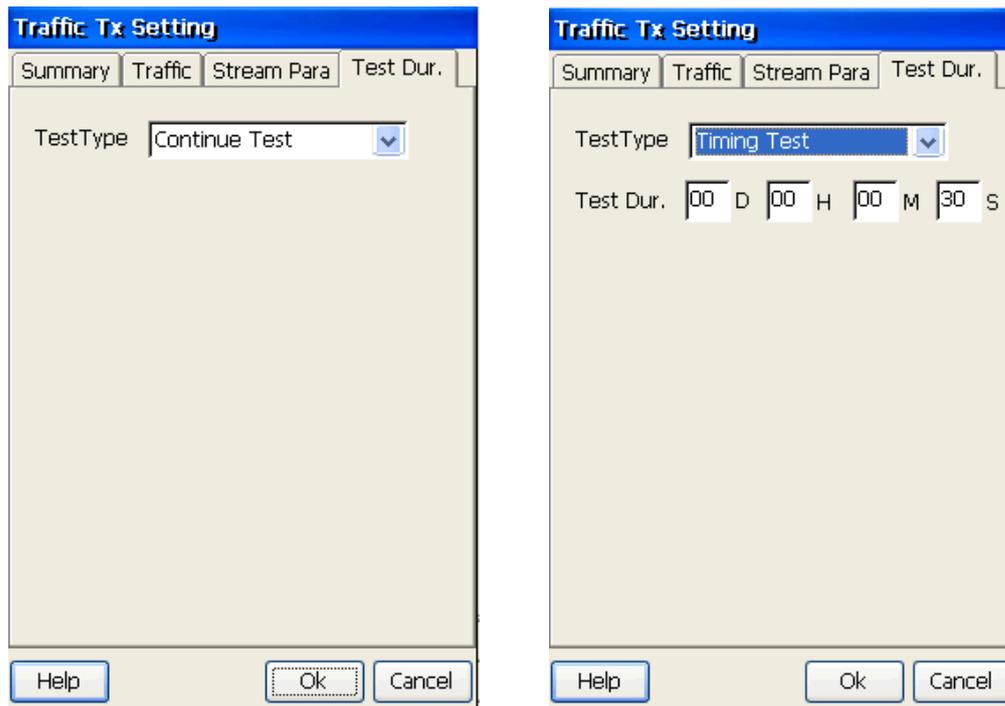


Figure 5.3.10 Sending Setting—Test Duration

## 5.4 Receiving Filter Setting

“**Filter Para. Set**” is clicked into setting box (filter setting) used for setting parameters of Port1 and Port2 receiving stream (following Rx-stream for short), including 8 pages: **Summary**, **MAC Layer**, **MPLS**, **VLAN**, **IP Layer**, **Stream Filter**, **Transport Layer and Err Filter**.

### 5.4.1 Summary

Used to disable or enable total filtering and display filtering parameters, as is shown in figure 5.4.1.

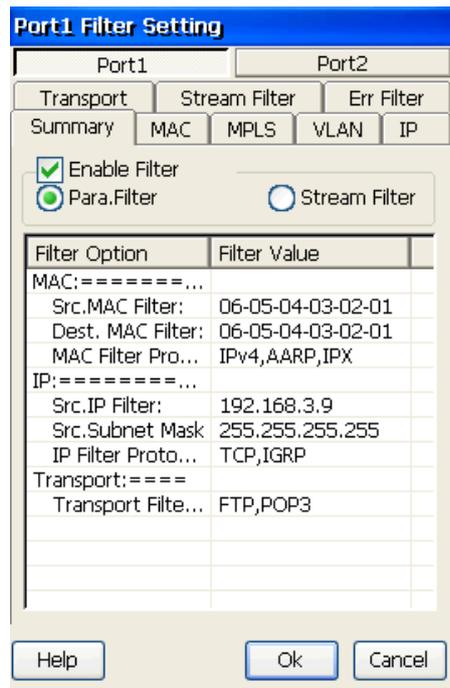


Figure 5.4.1 Filter Setting-Summary

[**Enable Filter**]: to enable or disable total filtering. “**Para. Filter**” and “**Stream Filter**” can be chose.

## 5.4.2 MAC Layer

Used for setting MAC layer parameters of Rx-stream filtering, as is shown in figure 5.4.2.

Before setting the parameters, “**Para. Filter**” on “**Summary**” page must be enabled. Parameters such as “**Src. MAC**”, “**Dest. MAC**”, “**Frame Type**”, “**Protocol Filter**” can be set after “**Enable Filter**” is checked on, and varieties of MAC-supporting upper-layer protocols can be selected if you want to receive frames of them.

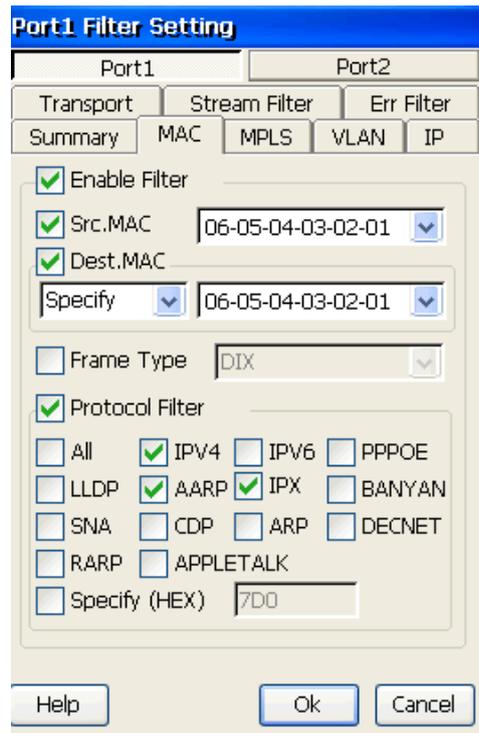


Figure 5.4.2 Filter Setting-MAC Layer Configuration

1. **[Enable Filter]**: to enable or disable MAC layer filtering.
2. **[Src. MAC]**: to set the source MAC address for filtering; the receiving frames with the source MAC can pass, and the others are discarded.

**Note:** following filtering mechanism is the same as above.

3. **[Dest. MAC]**: to set the destination filtering mode and its MAC address, supporting “Unicast”, ”Multicast”, ”Broadcast” and “Specify”; If “Specify” is selected, user can set the destination MAC address for filtering.
4. **[Frame Type]**: to set the frame type for filtering, supporting “DIX” and “802.3 SNAP”.
5. **[Protocol Filter]**: to set the MAC-supporting upper-layer protocols, supporting “IPv4”, “IPv6”, “PPPOE”, “LLDP”, “AARP”, “IPX”, “BANYAN”, “SNA”, “CDP”, “ARP”, “DECNET”, “RARP”, “APPLETALK” and “Specify(HEX)”. If “All” is checked on, all the protocols above will be chosen. When “Specify(HEX)” is selected,

---

user can input 2-byte protocol value. If the protocol value of Rx-frames matches one of the above, the frames can pass, otherwise are discarded.

### 5.4.3 MPLS

Used for setting MPLS parameters of Rx-stream filtering including “**Label**” and “**CoS**”, as is shown in figure 5.4.3. Before setting the parameters, “**Para. Filter**” on “**Summary**” page must be enabled.

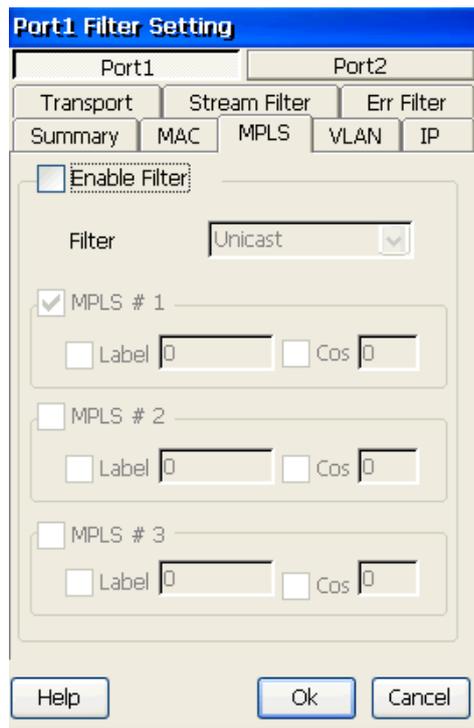


Figure 5.4.3 Filter Setting-MPLS Configuration

1. **[Enable Filter]**: to enable or disable MPLS filtering.
2. **[Filter Option]**: supporting “**Unicast**”, “**Multicast**” and “**All**”.
3. **[MPLS #1]**, **[MPLS #2]**, **[MPLS #3]**: To configure filtering parameters of each MPLS layer. “**Label**” (label value, range: 0~1048575) and **Cos** (service quality value, range: 0~7) parameters can be set.

---

## 5.4.4 VLAN

Used for setting VLAN parameters of Rx-stream filtering including “**ID**” and “**PRI**”, as shown in figure 5.4.4. Before setting the parameters, parameters “**Para. Filter**” on “**Summary**” page must be enabled.

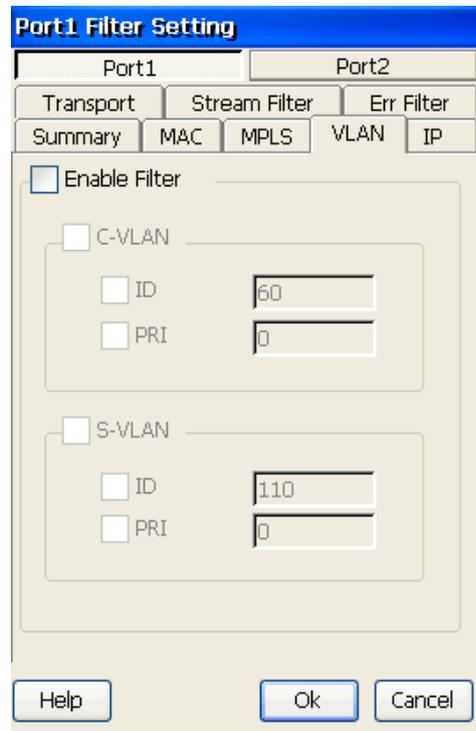


Figure 5.4.4 Filter Setting-VLAN Configuration

1. [**Enable Filter**]: to enable or disable VLAN filter.
2. [**C-VLAN**], [**S-VLAN**]: to configure VLAN parameters of which ID (range: 0~4095) and Priority (range: 0~7) can be set.



TPID of [**C-VLAN**] and [**S-VLAN**] use the port configuration value.

## 5.4.5 IP Layer

Used for setting IP layer parameters of Rx-stream filtering, as is shown in figure 5.4.5.

Before setting the parameters, “**Para. Filter**” on “**Summary**” page must be enabled.

Parameters such as “**Src. IP**”, “**Dest. IP**”, “**Src. Subnet Mask**”, “**Dest. Subnet Mask**”, “**TOS**”, “**Protocol Filter**”, can be set after “**Enable Filter**” is checked on, and varieties of IP-supporting upper-layer protocols can be selected if you want to receive frames of them.

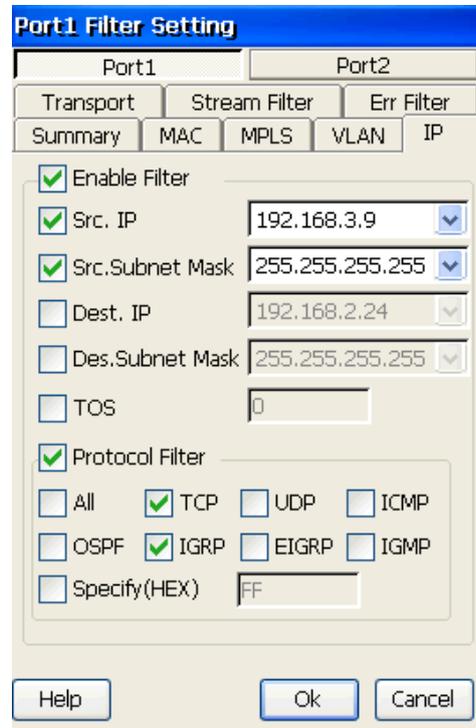


Figure 5.4.5 Filter Setting-IP Layer Configuration

1. [**Enable Filter**]: to enable or disable IP layer filtering.
2. [**Src. IP**]: to set for source IP filtering, the frames with the source IP will be received if checked on and others is filtered. the receiving frames with the source IP can pass, and the others are discarded.

**Note:** following filtering mechanism is the same as above.

3. [**Src. Subnet Mask**]: to set for source subnet mask filtering, such as “255.255.255.0”.
4. [**Dest. IP**]: to set for destination IP filtering.
5. [**Dest. Subnet Mask**]: to set for destination subnet mask filtering, such as “255.255.255.0”.

6. [TOS]: type of service, range: 0~255, must be set before testing.
7. [Protocol Filter]: to set for filtering of IP-supporting upper-layer protocols such as “TCP”, “UDP”, “ICMP”, “OSPF”, “IGRP”, “EIGRP”, “IGMP” and “Specify(HEX)”. If “All” is checked on, all the protocols above will be chosen. If “Specify(HEX)” is checked on, 1-byte user-defined protocol value can be input.

### 5.4.6 Transport Layer

Used for setting TCP layer parameters of Rx-stream filtering, as is shown in figure 5.4.6.

Before setting the parameters, “**Para. Filter**” on “**Summary**” page must be enabled. If “**Enable Filter**” is checked on, varieties of TCP-supporting upper-layer protocols such as “**FTP**”, “**HTTP**”, “**DHCP**”, “**SMTP**”, “**POP3**”, “**IMAP**”, “**DNS**”, “**RIP**”, “**RIPNG**”, “**BGP**”, “**NETBIOS**”, “**SNMP**”, “**Specify**”, can be selected if you want to receiving frames of them. If “All” is checked on, all the protocols above will be chosen. If “**Specify**” is checked on, 2-byte user-defined protocol value can be input based on “**TCP**” or “**UDP**” definition.

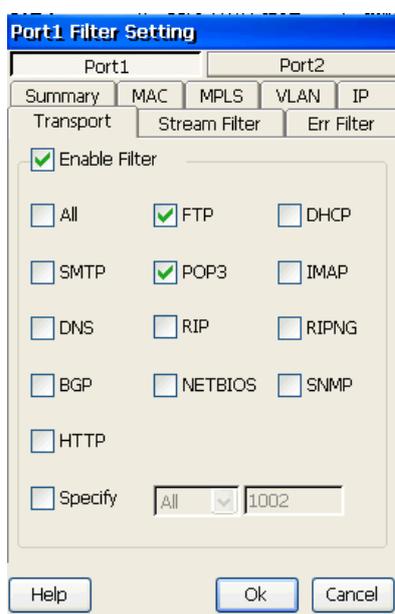


Figure 5.4.6 Filter Setting-Transport Layer Configuration

### 5.4.7 Stream filter

Used for setting Stream filter parameters of Rx-stream filtering, as is shown in figure 5.4.7.

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Before setting the parameters, “**Stream Filter**” on “**Summary**” page must be enabled. One or several stream sequence numbers can be selected if you want to receiving frames of corresponding stream sequence numbers. If “All” is checked on, all the stream sequence numbers above will be chosen.

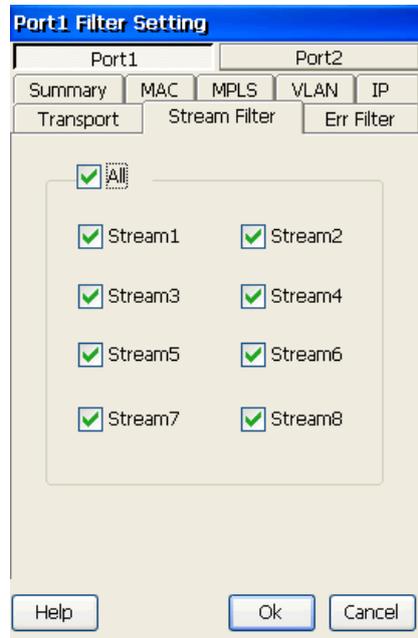


Figure 5.4.7 Filter Setting-Stream Filter Configuration

### 5.4.8 Err filter

Used for setting error filter parameters of Rx-stream filtering, as is shown in figure 5.4.8.

Before setting the parameters, “**Para. Filter**” on “**Summary**” page must be enabled. If “**Enable Filter**” is checked on, 4 kinds of error, such as “FCS Err”, “IP Checksum Err”, “TCP Checksum Err”, “UDP Checksum Err”, can be selected. When you select multiple errors, “AND” or “OR” operation can work well.

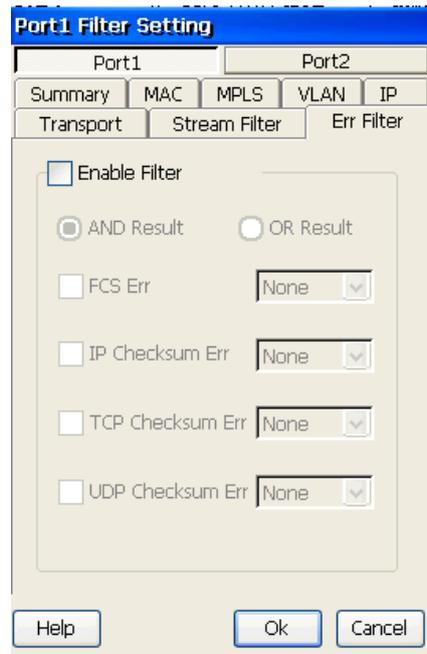


Figure 5.4.8 Filter Setting-Err Filter

1. **[Enable Filter]**: to enable or disable Err Filter parameters setting.
2. **[AND Result]/[OR Result]**: to decide that the final result of error filtering is AND result or OR result.
3. **[FCS Err]**: to set FCS Error filtering setting. When “FCS Err” is selected, the FCS status can be selected. “None” means that tester receives all of frames without FCS Error. If you select “Exist”, frames with only FCS Error will be received.
4. **[IP Checksum Err]**: to set IP Checksum Error filtering setting. When “IP Checksum Err” is selected, the IP Checksum status can be selected. “None” means that tester receives all of frames without IP Checksum Error. If you select “Exist”, frames with only IP Checksum Error will be received.
5. **[TCP Checksum Err]**: to set TCP Checksum Error filtering setting. When “TCP Checksum Err” is selected, the TCP Checksum status can be selected. “None” means that tester receives all of frames without TCP Checksum Error. If you select “Exist”, frames with only TCP Checksum Error will be received.

- 
6. **[UDP Checksum Err]**: to set UDP Checksum Error filtering setting. When “UDP Checksum Err” is selected, the UDP Checksum status can be selected. “None” means that tester receives all of frames without UDP Checksum Error. If you select “Exist”, frames with only UDP Checksum Error will be received.

## 5.5 BERT Parameters Setting

“**Rx Bert Para. Set**” is clicked into BERT setting box of Port1 and Port2 receiving error-bit filtering, as is shown in figure 5.5.1.

Receiving pattern setting is used for specifying the error-bit pattern with which the frames can be received. Patterns include “ $2^7-1$ ”, “ $2^9-1$ ”, “ $2^{11}-1$ ”, “ $2^{15}-1$ ”, “ $2^{20}-1$ ”, “ $2^{23}-1$ ”, “ $2^{29}-1$ ”, “ $2^{31}-1$ ” and corresponding bit-complementary codes, and “All 1’s”, “All 0’s”, “CRPAT”, “CJPAT”, “CSPAT”, “Specify(HEX)”.

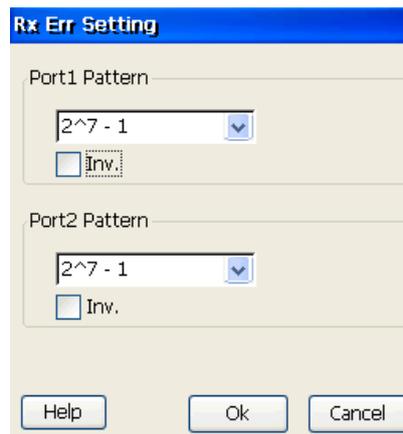


Figure 5.5.1 Rx Err Setting

## 5.6 RFC2544 Setting

“**RFC2544 Para. Set**” is clicked to enter into “**RFC2544 Para.**” setting box, with 3 pages: “**Summary**”, “**Mode**”, “**Frame Param.**”.

### 5.6.1 Summary

Summary is used to show current RFC2544 testing parameters, as is shown in figure

5.6.1.

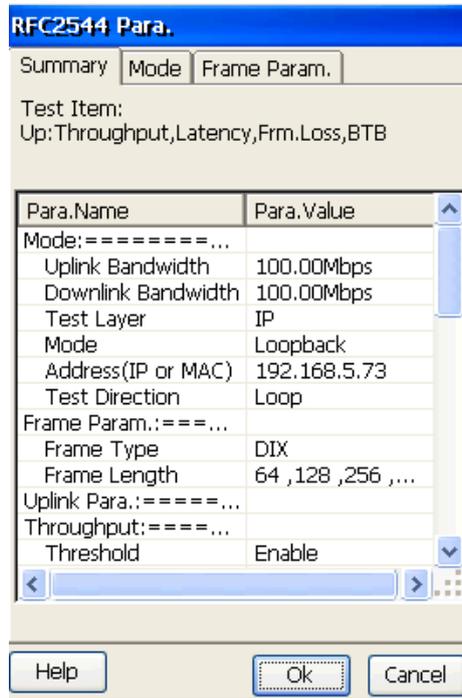


Figure 5.6.1 RFC2544 Summary

### 5.6.2 Mode

“Mode” is used to configure RFC2544 parameters including “Channel Bandwidth”, “Test Layer”, “Test Mode” and “Direction”, as is shown in figure 5.6.2.

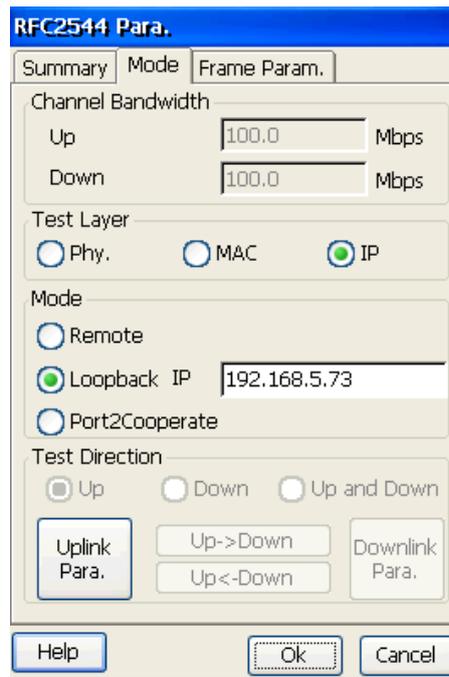


Figure 5.6.2 RFC2544 Mode Configuration

1. [**Channel Bandwidth**]: to set and show RFC2544 test bandwidth of “Up” and “Down”.
2. [**Test Layer**]: to set RFC2544 test layer with “**Physical**”, “**MAC**” and “**IP**” options.
3. [**Mode**]: to set RFC2544 test mode with “**Remote**”, “**Loopback**” and “**Port2 Cooperate**” options. IP address or MAC must be set when “**Remote**” or “**Loopback**” is selected.
4. [**Test Direction**]: to set which direction should be tested, with “**Up**”, “**Down**” and “**Up/Down**” options. Each option makes related setting button enabled or disabled.
5. [**Remote**]: the tester at near-end under RFC2544 test, with far-end cooperative peer in “**Cooperation**” which is another important function of GEA-8130A.
6. [**Loopback**]: local device sends frames, and receives the loopback frames from remote tester or device.
7. [**Port2 Cooperate**]: local device sends frames, and receives the cooperate frames

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from Port2 of local tester or device.

8. [**Uplink Para. / Downlink Para.**]: to set parameters about “**Throughput**”, “**Latency**”, “**Frm. Loss**”, “**Back to Back**”.

**Note:**

1. If the test layer is “physical”, remote mode is ineffective.
2. Click [**Uplink Para.**] or [**Downlink Para.**] button to configure corresponding parameters, which are “**Throughput**”, “**Latency**”, “**Loss Rate**”, “**Back to Back**”.
3. Click [**Up->Down**] button to make downstream configuration same as upstream.
4. Click [**Up<-Down**] button to make upstream configuration same as downstream.
5. When “**Up and Down**” direction is selected, the downlink parameters may not include “**Latency**”

### **5.6.2.1 Throughput**

Used to configure RFC2544 “**Throughput**” test parameters, with parameters including “**Limit**”, “**Lower-limit**”, “**Dur.**”, “**Tolerance**” and “**Threshold**”, as shown in figure

5.6.3.

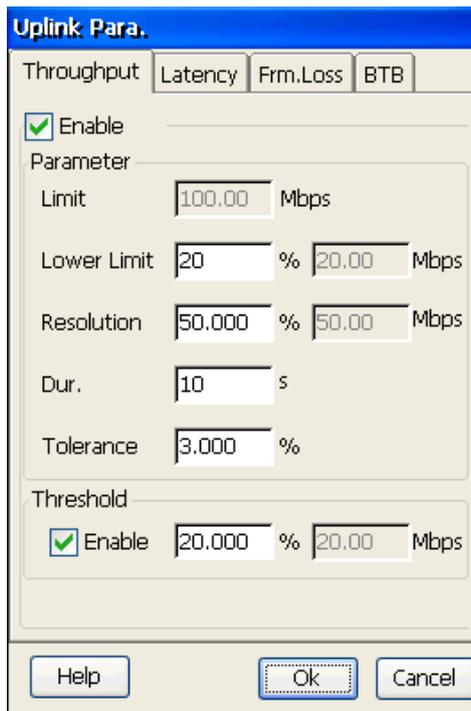


Figure 5.6.3 RFC2544 Throughput Test Configuration

1. **[Enable]:** to enable or disable throughput test.
2. **[Limit]:** to display maximum traffic for throughput test.
3. **[Lower-limit]:** to set minimum traffic for throughput test, range is [1~100]%. .
4. **[Resolution]:** to set traffic resolution for throughput test, range is [0.01~50.00]%. .
5. **[Dur.]:** to set duration time for throughput test, range is [2~3600]s.
6. **[Tolerance]:** to set lost-rate upper-limit for throughput test, range is [0~10.000]%. .
7. **[Threshold]:** when enabled, to set threshold value for throughput test, range is [1.00~100.00]%. It is used to verify the test result pass or failed.

### 5.6.2.2 Latency

Used to configure RFC2544 “**Latency**” test parameters, with parameters including “**Stream selection**”, “**Traffic Ratio**”, “**Dur.**”, “**Iterations**” and “**Threshold**”, as shown in figure 5.6.4.

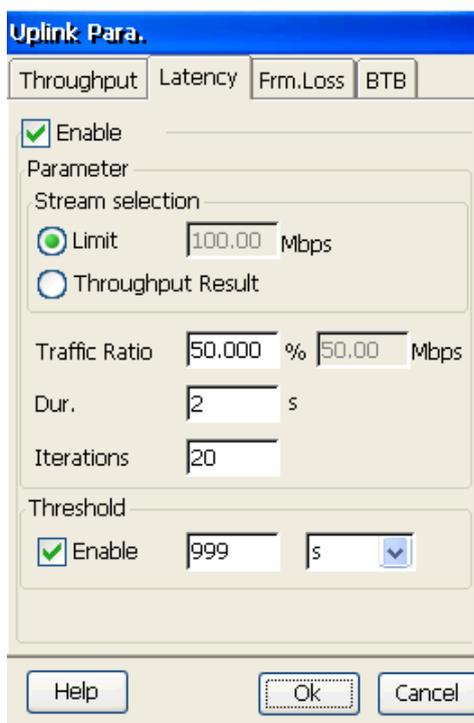


Figure 5.6.4 RFC2544 Latency Test Configuration

1. **[Enable]**: to enable or disable latency test;
2. **[Stream selection]**: to select traffic reference mode including 2 options:  
“Limit” and “Throughput Result”. It is used to make up-limit traffic.
3. **[Traffic Ratio]**: to set send traffic ratio of max traffic based on “Throughput”, range is [0.1~100.0] %.
4. **[Dur.]**: to set duration time of send traffic for latency test, range is [1~3600]s.
5. **[Iterations]**: to set repeats of latency test, range is [1~100].
6. **[Threshold]**: to enable or disable threshold for latency test, and to set threshold value, range is [1~100], including unit “s”, “ms” and “us” options. It is used to verify the test result pass or failed.

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### 5.6.2.3 Frm. Loss

Used to configure RFC2544 “**Frm. Loss**” test parameters, with parameters “**Limit**”, “**Lower-limit**”, “**Step**”, “**Dur.**” and “**Threshold**”, as shown in figure 5.6.5.

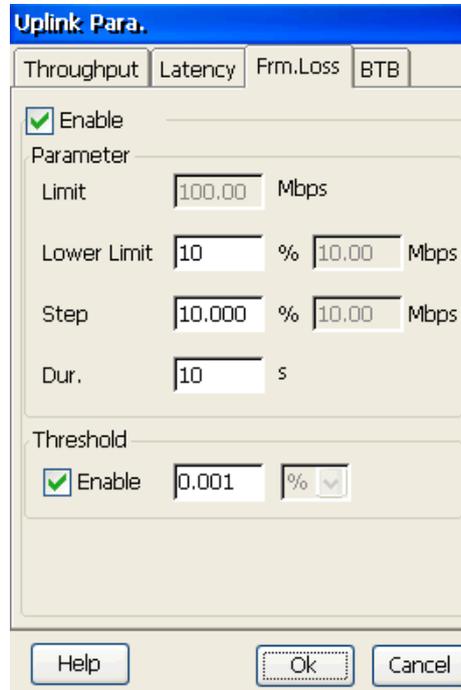


Figure 5.6.5 RFC2544 Loss-Rate Test Configuration

1. **[Enable]**: to enable or disable loss-rate test;
2. **[Limit]**: to display maximum traffic for loss-rate test.
3. **[Lower-limit]**: to set minimum traffic for loss-rate, range is [1~99]%.
4. **[Step]**: to set traffic step-size for loss-rate test, range is [0.1~10.0]%.
5. **[Dur.]**: to set duration time of loss-rate test, range is [2~3600]s.
6. **[Threshold]**: to enable or disable threshold for loss-rate, and to set threshold value, range is [0~100.000]%. It is used to verify the test result pass or failed.

### 5.6.2.4 Back to back

Used to configure RFC2544 “**Back to Back**” ( called “**BTB**” )test, with parameters

“Port”, “Burst Dur.”, “ Iterations ”and “Threshold”, as is shown in figure 5.6.6.

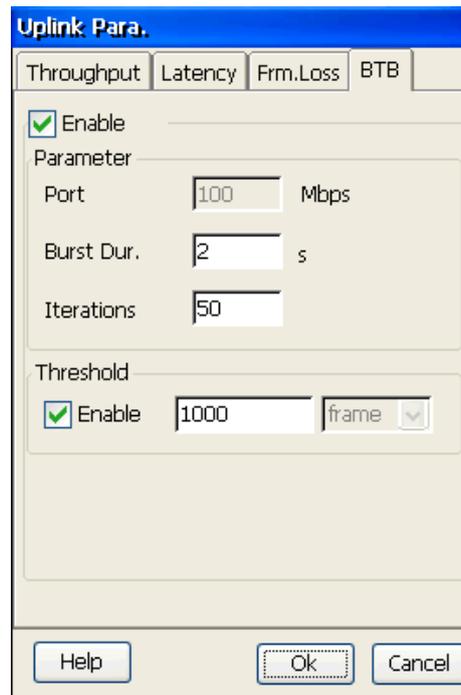


Figure 5.6.6 RFC2544 “BTB” Test Configuration

1. **[Enable]**: to enable or disable “back to back” test;
2. **[Port]**: to display maximum traffic for back to back test.
3. **[Burst Dur.]**: to set duration time of burst, range is [2~100]s.
4. **[Iterations]**: to set repeats of “Back to back” test, range is [1~100].
5. **[Threshold]**: to enable or disable threshold, range is [1~99999999]frames. It is used to verify the test result pass or failed.

### 5.6.3 Frame Param.

Used to configure RFC2544 “Frame Type” and “Normal Frame Length”, as is shown in figure 5.6.7.

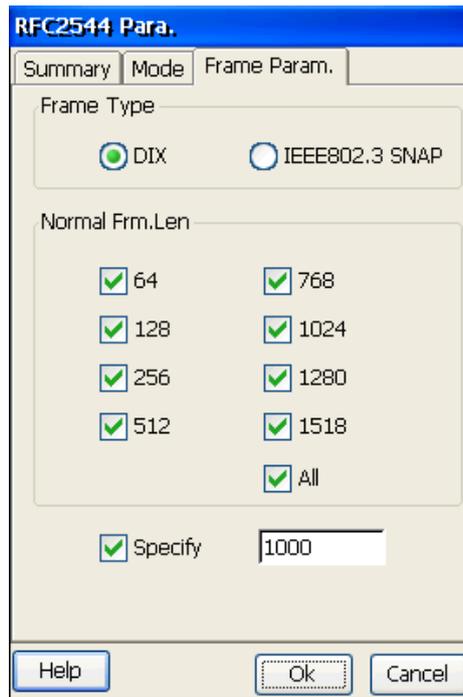


Figure 5.6.7 RFC2544 Frame parameter

1. **[Frame Type]**: to set RFC2544 send frame type, with “**DIX**” and “**IEEE802.3 SNAP**” options. DIX is support only in this version.
2. **[Normal Frame Length]**: to set frame length for the test, supporting “**64**”, “**128**”, “**256**”, “**512**”, “**768**”, “**1024**”, “**1280**”, “**1518**” length options. **[Specify]** is used to customize test frame, range: 64~10000.

## 5.7 Y.1564 Setting

“**Y.1564 Para. Set**” is clicked into the setting box , with 3 pages: “**Summary**”, “**Mode**”, “**Config Param.**”.

### 5.7.1 Summary

Summary is used to show current Y.1564 testing parameters, as is shown in figure 5.7.1.

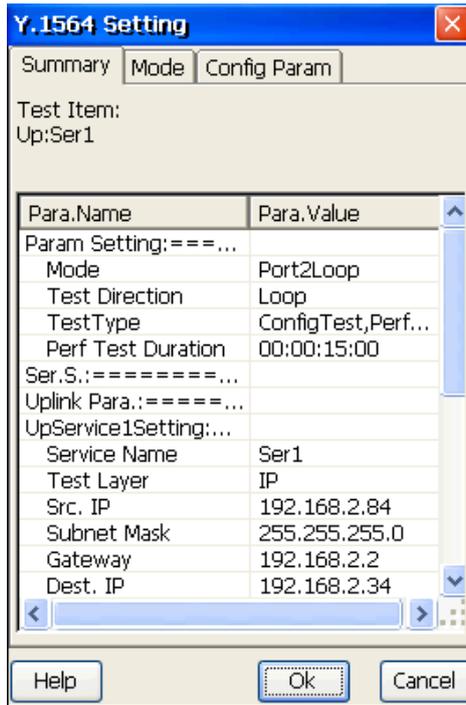
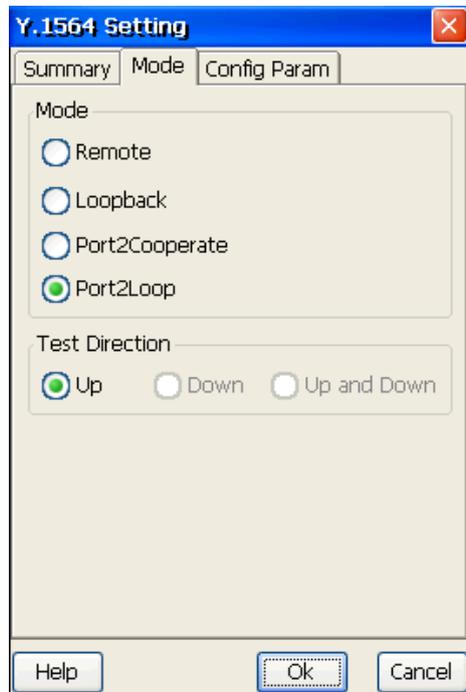


Figure 5.7.1 Y.1564 Summary

## 5.7.2 Mode

“**Mode**” is used to configure Y.1564 test, including “**Mode**” and “**Test Direction**”, as is shown in figure 5.7.2.



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Figure 5.7.2 Y.1564 Mode

1. **[Mode]**

To set mode of Y.1564 test, including “**Remote**”, “**Loopback**”, “**Port2Cooperate**” and “**Port2Loop**”.

**[Remote]**: the tester at near-end under Y.1564 test, with far-end cooperative peer in “Cooperation” which is another important function of GEA-8130A.

**[Loopback]**: local device sends frames, and receives the loopback frames from remote tester or device.

**[Port2Cooperate]**: local device sends frames, and receives the cooperate frames from Port2 of local tester or device.

**[Port2Loop]**: local device sends frames, and receives the loopback frames from Port2 of local tester or device.

2. **[Test Direction]**

To set direction of Y.1564 test, including “Up”, “Down” and “Up and Down”.

### **5.7.3 Config Param.**

“**Config Param.**” is used to configure Y.1564 test type, services parameters, duration of performance test, as is shown in figure 5.7.3.

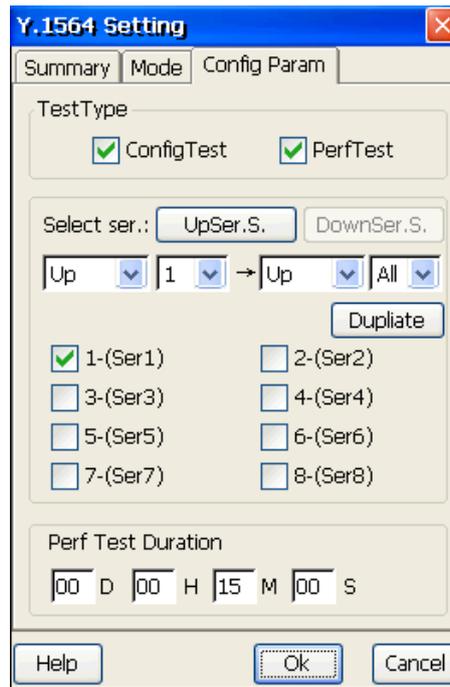


Figure 5.7.3 Y.1564 Setting—Config. Param.

1. **[Test Type]**: to set test type, including Configuration Test and Performance Test.
2. **[Select ser]**: to set parameters of 8 services and testing services.

The buttons of “UpSer. S.” and “DownSer. S.” are used to set services parameters of UP and DOWN direction. See chapter 5.7.3.1-5.7.3.6.

[Dupliate]: to copy parameters of the set service to parameters of unset services.

3. **[Perf Test Duration]**: to set duration for performance testing. The format of duration is XX day XX hour XX minute XX second. Value of each unit is the integer less than 100.

### 5.7.3.1 Colligate Setting

Colligate setting is used to set based parameters of services, including Service Name, Source IP, Subnet, Gateway, Destination IP, TOS, TTL, VLAN and MPLS, as is shown in figure 5.7.4.

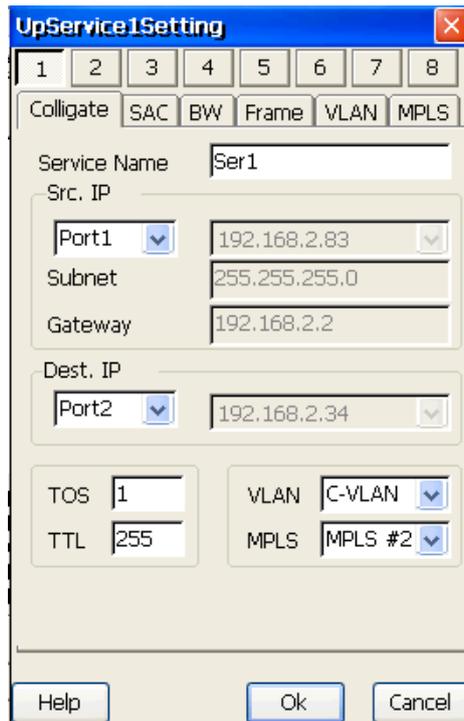


Figure 5.7.4 Y.1564 Setting -- Colligate Setting

1. **[Service Name]**: to set current service name.
2. **[Src. IP]**: to set source IP address of current service. “Port1” and “Specify” can be selected. And when “Port1” is selected, the edit box will show IP address of the local Port1 automatically. You can also select “Specify” to input user-defined source IP address. The format is as “XXX.XXX.XXX.XXX”.
3. **[Subnet]**: to set subnet mask of current service IP address. And when “Specify” of [Src. IP] is selected, you can input subnet mask.
4. **[Gateway]**: to set gateway of the network. When “Specify” of [Src. IP] is selected, you can input gateway.
5. **[Dest. IP]**: to set destination IP address of current service. “Port2” and “Specify” can be selected. And when “Port2” is selected, the edit box will show IP address of the local Port2 automatically. You can also select “Specify” to input user-defined destination IP address. The format is as “XXX.XXX.XXX.XXX”.

- 
6. **[TOS]**: to set TOS value of current service, the range is 1~255.
  7. **[TTL]**: to set TTL value of current service, the range is 1~255.
  8. **[VLAN]**: to set VLAN level of Tx-stream. The detail information of VLAN will be set in VLAN tab.
  9. **[MPLS]**: to set MPLS level of Tx-stream. The detail information of MPLS will be set in MPLS tab.

**Note:** Src. IP is IP address of sending device, and Dest. IP is IP address of receiving device. For example, on UP testing, Src. IP is the local IP of sending packet, and Dest. IP is the cooperation or loopback IP. On DOWN testing, Src. IP is the cooperation or loopback IP receiving packet, and Dest. IP is the local IP of sending packet.

### 5.7.3.2 SAC Setting

Used to set SAC parameters. SAC is Service Acceptance Criteria. The acceptance criteria includes Loop FTD, FDV, FLR, AVAIL, as is shown in figure 5.7.5.

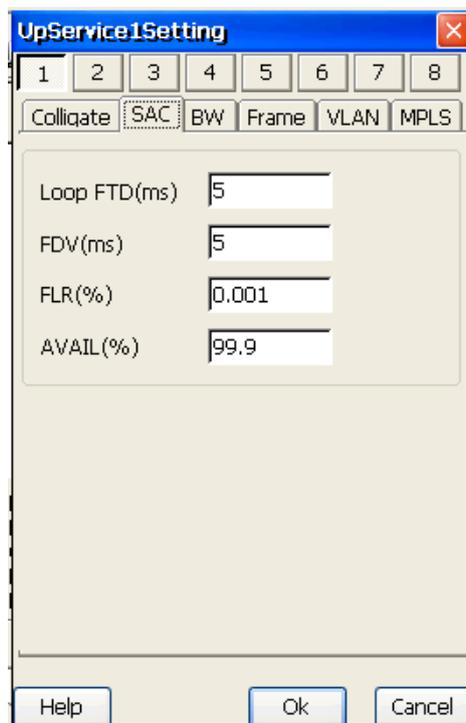


Figure 5.7.5 Y.1564 Setting – SAC Setting

1. **[Loop FTD]**: to set acceptance loop frame transfer delay. The range is 1~999999 and unit is ms.
2. **[FDV]**: to set acceptance frame delay variation. The range is 1~999 and unit is ms.
3. **[FLR]**: to set acceptance frame loss ratio. The range is 0~100, and the precision is 0.001.
4. **[AVAIL]**: to set acceptance availability. The range is 0~100, and the precision is 0.1.

### 5.7.3.3 Bandwidth Setting

Used to set bandwidth parameters, including CIR, Step, Time and EIR, as is shown in figure 5.7.6.

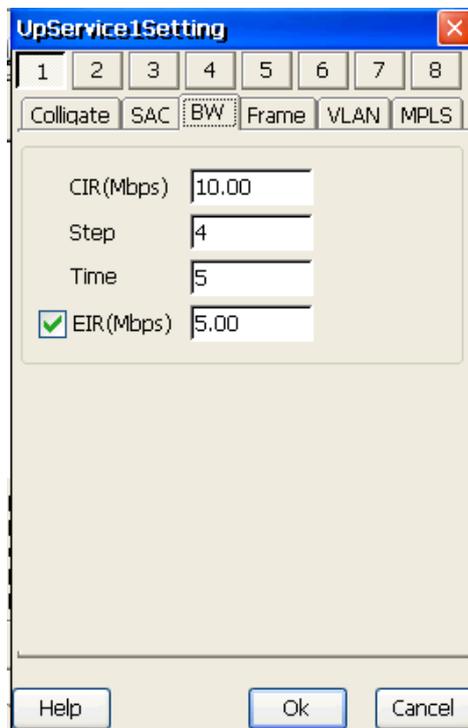


Figure 5.7.6 Y.1564 Setting – BW Setting

1. **[CIR]**: to set committed information rate. The range is 0.10~1000.00, unit is Mbps, and the precision is 0.01.
2. **[Step]**: to set step count of CIR testing. The range is 1~4, and step must be a integer.

3. **[Time]**: to set step time of CIR testing. The range is 1~60, and the value must be a integer.
4. **[EIR]**: to enable excess information rate and set EIR. The range is 0.00~1000.00, unit is Mbps, and the precision is 0.01.

### 5.7.3.4 Frame

Used to set frame type and frame length, as is shown in figure 5.7.7.

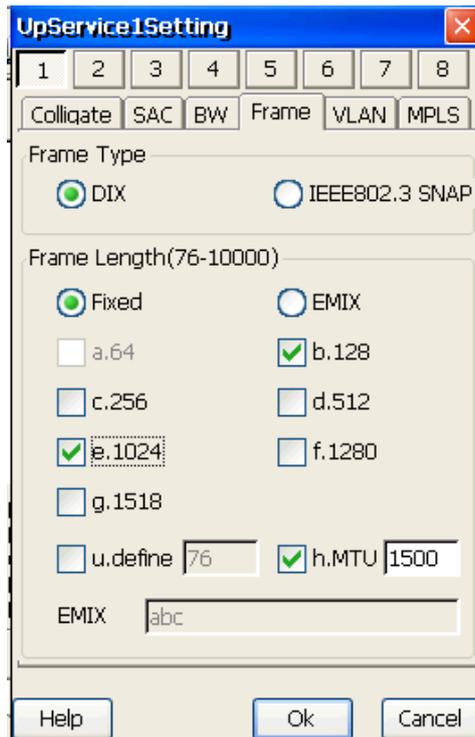


Figure 5.7.7 Y.1564 Setting – Frame Setting

1. **[Frame Type]**: to set frame type, DIX or IEEE802.3 SNAP by selecting corresponding check box.
2. **[Frame Length]**: to set frame length. Frame length includes Fixed and EMIX. When Fixed is selected, you can select given frame lengths, and specify frame length and Maximum Transmission Unit (MTU) which limits frame length current device can transfer. If you select EMIX, you will input symbols among a, b, c, d, e, f, g, u and h which represent frame length. Above figure shows the meanings of a, b, c, d, e, f, g, u and h.

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**Note:** EMIX frame length is 16 kind. The range of define and MTU is 64~10000.

### 5.7.3.5 VLAN

Used to set Color Aware, Green, Yellow, the parameters of each level VLAN, and so on, as is shown in figure 5.7.8.

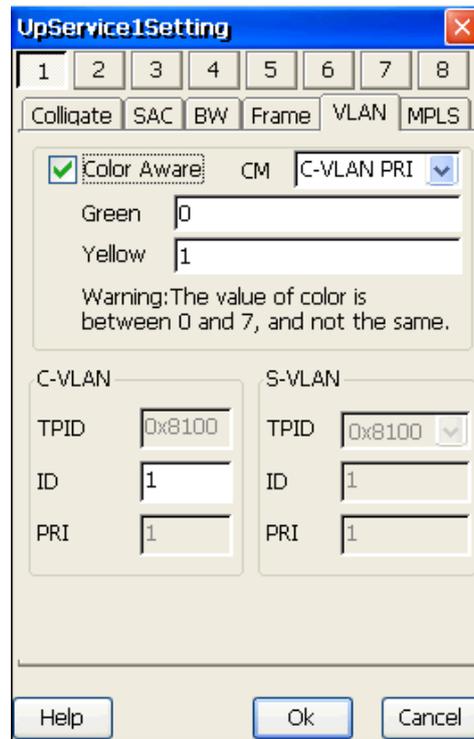


Figure 5.7.8 Y.1564 Setting –VLAN Setting

#### 1. [Color Aware]

**[Color Aware]:** to enable or disable color aware. When Color Aware is selected, some parameters will be set as following:

**[CM]:** to set color mode, including C-VLAN PRI and S-VLAN PRI.

**[Green]:** to set green frames priority. Each priority is between 0 and 7.

**[Yellow]:** to set yellow frames priority. Each priority is between 0 and 7.

**Note:**

---

1) Green frames and yellow frames support multiple priorities and set way. For example:

Green: [1, 3, 5] means having 3 priorities, 1, 3, 5, split by comma.

Green: [1, 3, 5-7] means having 5 priorities, 1, 3, 5, 6 and 7, used by comma and '-'.

2) Priority of green frames must be different with yellow.

## 2. [C-VLAN]

When level of VLAN in Colligate tab is set C-VLAN or S-VLAN, parameters of C-VLAN will enable.

[**TPID**]: not to be set, 0x8100.

[**ID**]: to set C-VLAN ID. The range is 0~4095.

[**PRI**]: to set C-VLAN priority. The range is 0~7. When Color Aware is selected and color mode is C-VLAN PRI, the priority disables.

## 3. [S-VLAN]

When level of VLAN in Colligate tab is set S-VLAN, parameters of S-VLAN will enable.

[**TPID**]: to set S-VLAN type ID, including 0x8100, 0x9100, 0x9200, 0x88A8, 0x9300.

[**ID**]: to set S-VLAN ID. The range is 0~4095.

[**PRI**]: to set S-VLAN priority. The range is 0~7. When Color Aware is selected and color mode is S-VLAN PRI, the priority disables.

### 5.7.3.6 MPLS

Used to set MPLS parameters for performance testing, as is shown in figure 5.7.9.

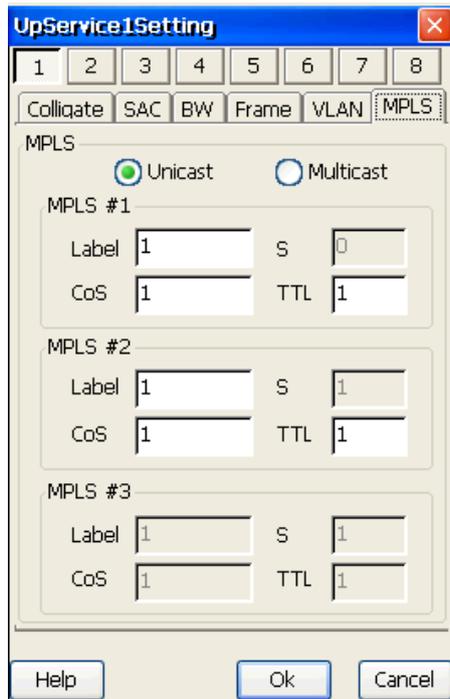


Figure 5.7.9 Y.1564 Setting – MPLS Setting

1. [MPLS Mode]: Support “Unicast” and “Multicast”.

[Unicast]: to send MPLS unicast message.

[Multicast]: to send MPLS multicast message.

2. [MPLS#1,#2,#3]: To set each level of MPLS.

[Label]: Label value of MPLS, range: 0~1048575;

[S]: Disabled, just to display the status of each MPLS layer; “1” is shown for the last layer, and “0” is shown for others;

[Cos]: Service quality value of MPLS, range: 0~7;

[TTL]: TTL (survival time) value of MPLS Header, range: 0~255.

## 5.8 Transport Layer Setting

“Transport Parameters” is clicked into transport layer setting box used for setting different

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application layer protocol port numbers, as is shown in figure 5.8.1.

Transport Layer Setting			
HTTP	80	POP3	110
FTP	21	IMAP	143
DHCP	67	DNS	53
SNMP	161	SMTP	25
RIP	520	RIPng	521
NETBIOS	137	BGP	179
PRINT	515		

Buttons: Help, Default, Ok, Cancel

Figure 5.8.1 Transmission Port Configuration

Port numbers of transport-supporting upper-layer protocols such as HTTP, POP3, FTP, IMAP, DHCP, DNS, SNMP, SMTP, RIP, RIPng, NETBIOS, BGP and PRINT can be specified.

**[Default]:** used to restore default port numbers.

## 5.9 Wire&Port Tools

Wire&Port Tools include 5 modules as follows: Wire Length (electricity port), Wire Order (electricity port), Wire Tracer, Port Blind, PoE Test and Port Identify, as is shown in figure 5.9.1 .

PoE test work in through mode, and other test work in terminal mode.

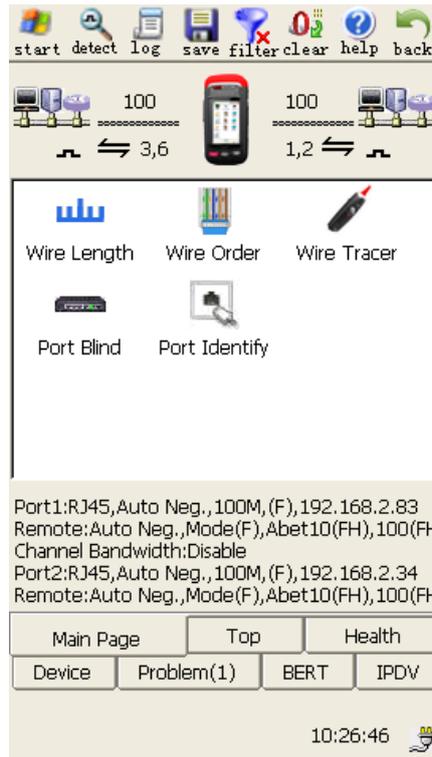


Figure 5.9.1 Wire&Port Tools

## 5.9.1 Wire Length

### 5.9.1.1 Basic Function

Wire length test is used for testing wire length of twisted-pair's each pair , the test accuracy is 1 meter, the test available range is 1 meters to 100 meters, as is shown in figure 5.9.2.

Connect the cable to be tested to Port1 and keep its far-end open

Calibration Para.	Result(Precision:1m)
<input checked="" type="checkbox"/> Calibration	Pairs Length(m)
Measured	Pairs1 0
<input type="text" value="1"/>	Pairs2 0
Actual	Pairs3 0
<input type="text" value="1"/>	Pairs4 0

Wire Length	Top	Health
Device	Problem(2)	BERT
		IPDV

Figure 5.9.2 Wire Length

1. **[Calibration Para.]:** Set instance calibration parameter;
  - a) Calibration: you can decide whether to calibrate the measurement results. Options include ON and OFF, select yes or no as you want.
  - b) Measured length: measured length of the reference wire.
  - c) Actual length: the actual length of the reference wire.
2. **[Results]:** Display test results of wire length.
3. **[Measure]:** Start wire length measurement.



1. The actual length of the unreferenced wire = (The actual length of the reference wire - The measured length of the reference wire) + The measured length of the unreferenced wire.
2. Wire length measurement can only be used when the electrical port is 1000M. If the port configuration is electrical, the system will automatically configure 1000M electrical package,

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when wire length is done.

3. When testing the wire length, please make sure one end of wire is connected to the port, and the other end isn't connected to any equipment.

### **5.9.1.2 Topological Structure**

Test structure of wire length is shown in figure 5.9.3.

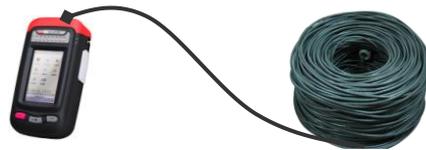


Figure 5.9.3 Wire Length Test Topology

## **5.9.2 Wire Order**

### **5.9.2.1 Basic Function**

Wire order test is used for testing the line sequence of twisted-pair, ensure whether the wiring order of twisted-pair is right, whether short circuit or open circuit, whether crosstalk etc, as is shown in figure 5.9.4.

Local		Remote	Details
1		1	
2		2	
3		3	
6		6	
4		4	
5		5	
7		7	
8		8	

Wire Order	Top	Health
Device	Problem(2)	BERT
		IPDV

Figure 5.9.4 Wire Order

1. **[Local], [Remote]:** The end connects to the instrument is local end, the end connects to line sequence tester is far end, the test results are displayed with different colors.
2. **[Details]:** Show the instructions for open circuit, short circuit, invalid, crosstalk etc.
3. **[Measure]:** Start line sequence test.

### 5.9.2.2 Topological Structure

Wire order test needs line sequence tester's cooperation. Topological structure is shown in figure 5.9.5.



Figure 5.9.5 Wire Order Test Topology

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## 5.9.3 Wire Tracer

### 5.9.3.1 Basic Function

Wire tracer test is used for checking function of destination wire, finding wire through sending audio signal to wire and matching the Wire Tracer (beeping), as is shown in figure 5.9.6.

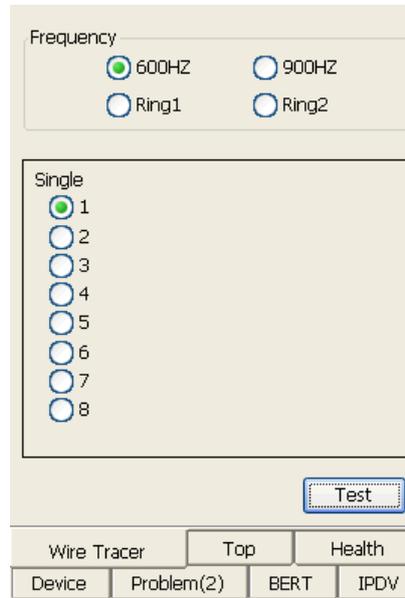


Figure 5.9.6 Wire Tracer

**[Frequency Selection]:** Select frequency of wire's sending audio signal, include 600HZ, 900HZ, Ring1, Ring2.

### 5.9.3.2 Topological Structure

Wire tracer test needs line sequence tester's cooperation, topological structure is shown in figure 5.9.7.

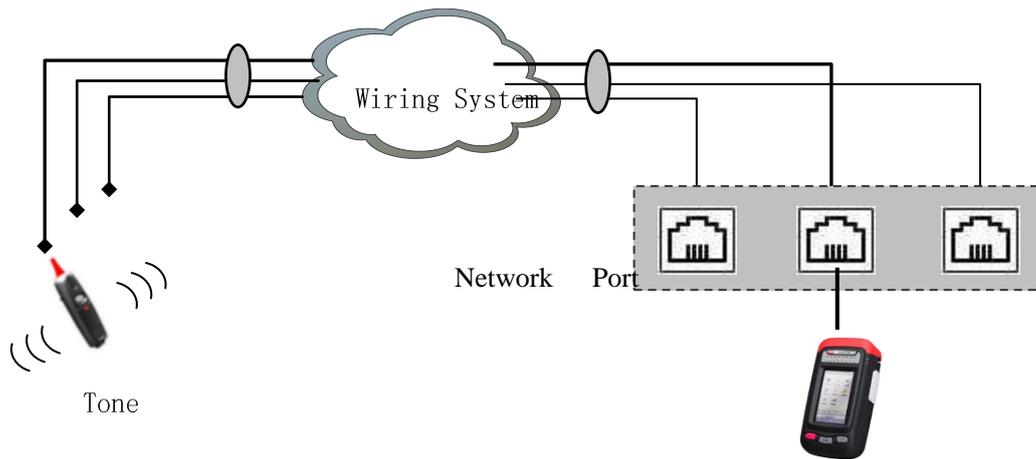


Figure 5.9.7 Wire Order Test Topology

## 5.9.4 Port Blind

### 5.9.4.1 Basic Function

Port blind test is used for testing which port of Ethernet hubs or switch current wire connects with.

When port is checked, the corresponding port will flash, as is shown in figure 5.9.8.

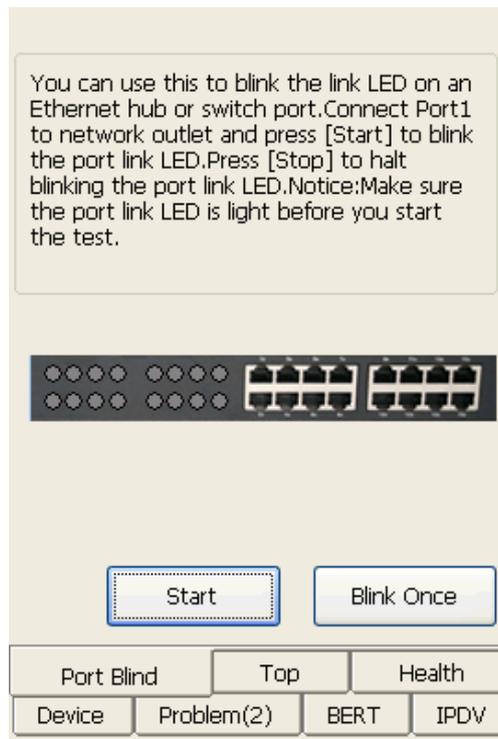


Figure 5.9.8 Port Blind

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[Start/Stop]: Start/Stop continuous flashing port when pressing the button.

[Blink Once]: Flash along with pressing this button.

### 5.9.4.2 Topological Structure

Topological structure of Port Blind is shown in figure 5.9.9.

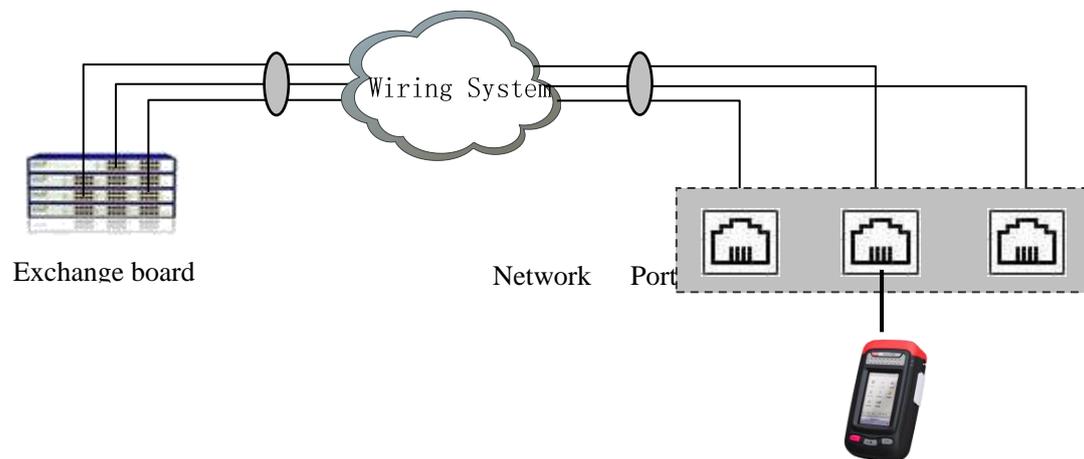


Figure 5.9.9 Port Blind Topological Structure

## 5.9.5 PoE Test

### 5.9.5.1 Basic Function

PoE test is used to test whether network devices (router or switch) supply electricity for terminal devices, and whether terminal devices are PoE power receiving equipment. Otherwise, if current tester connects power supply equipment and power receiving equipment, the tester will transfer electricity from power supply equipment to power receiving equipment, as is shown in figure 5.9.10.

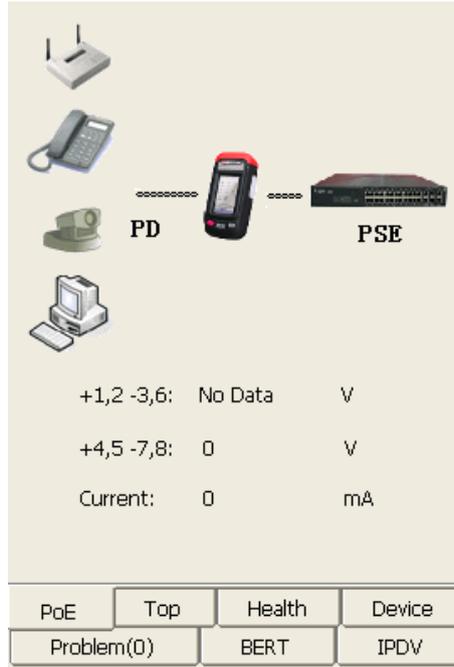


Figure 5.9.10 PoE Test

Under through mode, port1 of tester tests power supply equipment and port2 tests power receiving equipment. And under terminal mode, power supply equipment only can be tested. If the PoE light of port1 is on, it means that equipment connecting with port1 is power supply equipment.

### 5.9.5.2 Topological Structure

Topological structure of PoE Test is shown in figure 5.9.11.

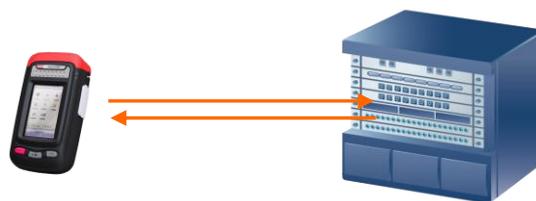
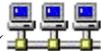


Figure 5.9.11 PoE Test Topological Structure

### 5.9.6 Port Identify

This function identifies type of wire connecting with port1, for example, Ethernet ()

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telephone (  ), token-ring (  ), equipment with no electricity (  ), unconnected cable (  ) and so on, as is shown in figure 5.9.12.

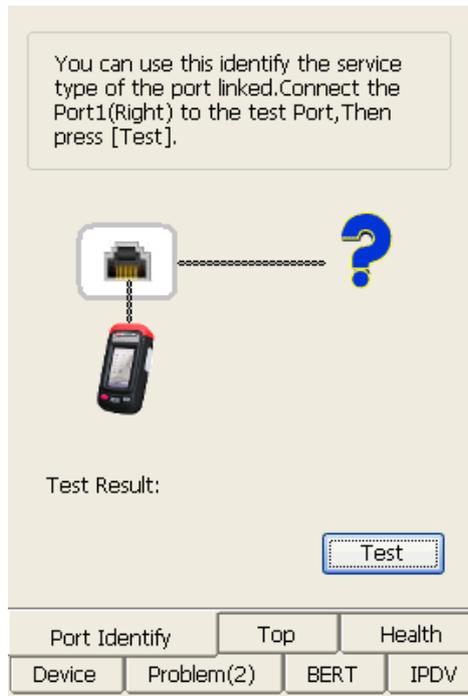


Figure 5.9.12 Port Identify

## 5.10 Network Performance

Network performance contains Traffic Test, RFC2544 Test, Y.1564 Test, Cooperation, Loopback, Download Speed, High Speed Ping, Server Performance and so on, which test and describe performance of network.

### 5.10.1 Traffic Test

For Traffic parameter setting, port setting, sending setting and receiving filter setting, please refer to chapter 5. 2, 5.3 and 5.4.

### 5.10.1.1 Basic Function

The function of Traffic Test realizes receiving frames, sending frames, frame statistics and inserting error, as is shown in figure 5.10.1.

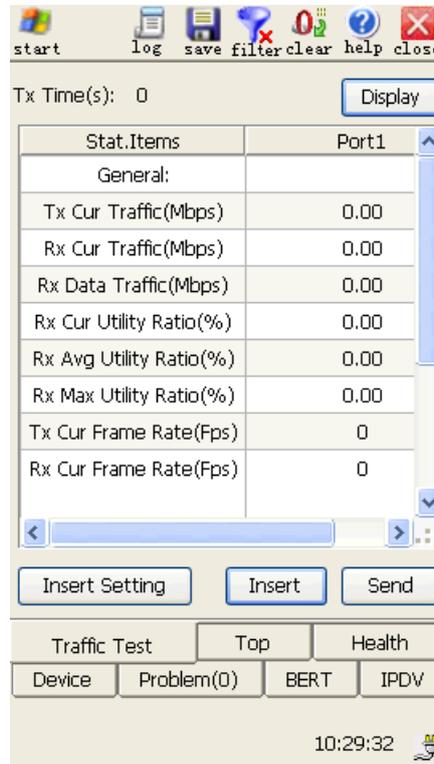


Figure 5.10.1 Traffic Test

1. **[Display]**: to control the list items, including : “**General**”, “**Error/PAUSE**”, “**Err Info**”, “**Dadi**”, etc. as is shown in figure 5.10.2.

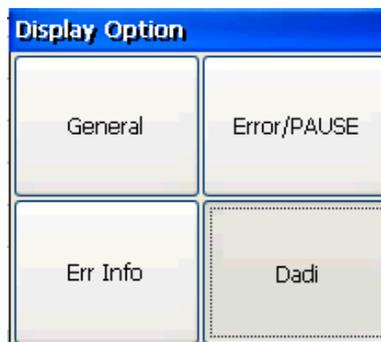


Figure 5.10.2 Traffic Test-Display

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2. **[Insert Setting]**: to set error type and insert mode of inserting error, which including FCS error, IP Check Error, TCP Check Error, PAUSE frames and bert, as is shown in figure 5.10.3. But if multiple stream test or test level is physical layer, error must not be inserted.

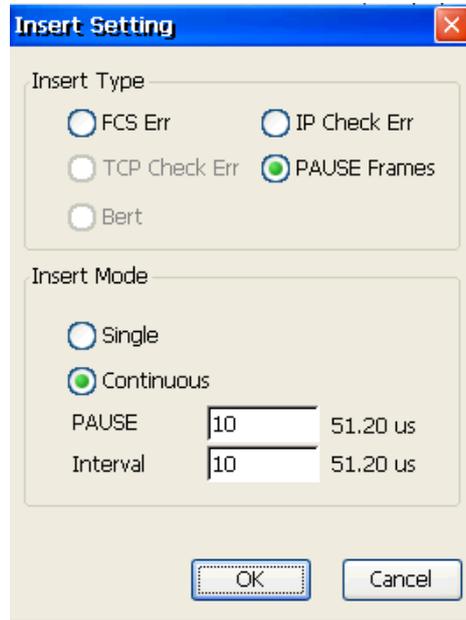


Figure 5.10.3 Traffic Test—Insert Setting

**[FCS Error]**: to supply 2 modes to insert, Burst and Ratio. If Burst is selected, burst count needs to be set, and ratio is set in Ratio mode. The error applies to MAC layer, IP layer, transport layer of single stream testing.

**[IP Check Error]**: to supply 2 modes to insert, Burst and Ratio. If Burst is selected, burst count needs to be set, and ratio is set in Ratio mode. The error applies to IP layer, transport layer of single stream testing.

**[TCP Check Error]**: to supply 2 modes to insert, Burst and Ratio. If Burst is selected, burst count needs to be set, and ratio is set in Ratio mode. The error applies to transport layer of single stream testing.

**[Bert]**: to supply 2 modes to insert, Burst and Ratio. If Burst is selected, burst count needs to be set, and ratio is set in Ratio mode. The error applies to MAC layer and IP layer of single stream testing with enabling bert.

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**[PAUSE Frames]:** If PAUSE Frames is used, pause time must be set, range 0~65535. Unit is time which 512 bit are sent. PAUSE Frames supplies 2 modes, Single and Continuous. Single mode means that pause frame is insert with clicking. In continuous mode, interval time must be set to control the time of inserting pause frame. The range of interval time is 0~16777215, and unit is as same as pause time's.

3. **[Tx Duration]:** duration time from sending first frame to current.
4. **[Send/Stop]:** to start or stop sending traffic.
5. **[Insert/Stop]:** to start or stop to insert error-bits. "Insert" can be pressed after system starts sending. If the "Insertion Mode" is "Manual-Burst" or "Single", "Insert" is pressed to trigger one-time insertion; if "Insertion Mode" is "Auto-Ratio" or "Continuous", "Insert" is pressed to start error insertion continuously and "Stop" is pressed to stop.

**Statistic Items:** to show test results, including following items:

**[Normal]:**

1. **[Tx Curr. Traffic(Mbps)]:** sending traffic in Mbps unit and 0.01Mbps precision.
2. **[Rx Curr. Traffic(Mbps)]:** receiving traffic of L1 in Mbps unit and 0.01Mbps precision.
3. **[Rx Data Traffic(Mbps)]:** receiving traffic of L2 in Mbps unit and 0.01Mbps precision.
4. **[Rx Curr. Utility Ratio(%)]:** current receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
5. **[Rx Avg. Utility Ratio(%)]:** average receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
6. **[Rx Max Utility Ratio(%)]:** Max receiving Bandwidth Ratio of L2 in 0.01Mbps

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precision.

7. **[Tx Curr. Frame Rate(Fps)]**: current sending velocity.
8. **[Rx Curr. Frame Rate(Fps)]**: current receiving velocity.
9. **[Rx Avg. Frame Rate(Fps)]**: average receiving velocity.
10. **[Rx Max Frame Rate(Fps)]**: max receiving velocity.
11. **[Tx Frames]**: total frames of sending.
12. **[Rx Frames]**: total frames of receiving.
13. **[Tx Bytes]**: total bytes of sending.
14. **[Rx Bytes]**: total bytes of receiving.
15. **[Rx Error Frms.]**: Error frames of receiving.

**[Error/PAUSE]:**

1. **[Tx FCS Err.]**: FCS error frames of sending.
2. **[Rx FCS Err.]**: FCS error frames of receiving.
3. **[Rx MAC Err. Rate]**: MAC Layer error frames of receiving.
4. **[Tx IP Err.]**: IP error frames of sending.
5. **[Rx IP Err.]**: IP error frames of receiving.
6. **[Tx TCP Err. Frms.]**: TCP error frames of sending.
7. **[Rx TCP Err. Frms.]**: TCP error frames of receiving.
8. **[Tx PAUSE Frames]**: pause frames of sending.
9. **[Rx PAUSE Frames]**: pause frames of receiving.

**[Err. Info.]:**

- 
1. **[Desync. Secondes]**: desynchronous seconds.
  2. **[Tx Err. Bits]**: error code bits of sending.
  3. **[Rx Err. Bits]**: error code bits of receiving.
  4. **[Avg. BER]**: in the synchronous status, the average ratio of error code bits and all the receiving random code bits.
  5. **[BER/Sec]**: in the synchronous status, ratio of error code bits and all the receiving random code bits in the current second.
  6. **[BES]**: in the synchronous status, seconds during which sending frames contain error code bits.

**[DADI Frms.]**:

1. **[TX Curr. Traffic(Mbps)]**: sending traffic in Mbps unit and 0.01Mbps precision.
2. **[RX Curr. Traffic(Mbps)]**: receiving traffic of L1 in Mbps unit and 0.01Mbps precision.
3. **[RX Data Traffic(Mbps)]**: sending traffic of L2 in Mbps unit and 0.01Mbps precision.
4. **[Rx Curr. Utility Ratio(%)]**: current receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
5. **[Rx Avg. Utility Ratio(%)]**: average receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
6. **[Rx Max. Utility Ratio(%)]**: max receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
7. **[Tx Frames]**: total frames of sending.
8. **[Rx Frames]**: total frames of receiving.

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9. **[Tx Bytes]**: total bytes of sending.
  10. **[Rx Bytes]**: total bytes of receiving.
  11. **[Rx Out of Seq.]**: receiving bytes of out-of-order frames .
  12. **[Rx Error Frms.]**: error frames of receiving.
  13. **[Lost Frms]**: lost frame of sending.
  14. **[Frm. Loss(%)]**: Receiving Lost rate to sending.



1. Start to count data as soon as the system starts to test traffic.
2. System sends traffic only after ARP succeeds in IP layer; otherwise, system will give warning.

### 5.10.1.2 Topology Structure

Traffic test statics the net data tested by single system or two cooperating systems. Test topology structure pictures as follows, figure 5.10.4 and figure 5.10.5.

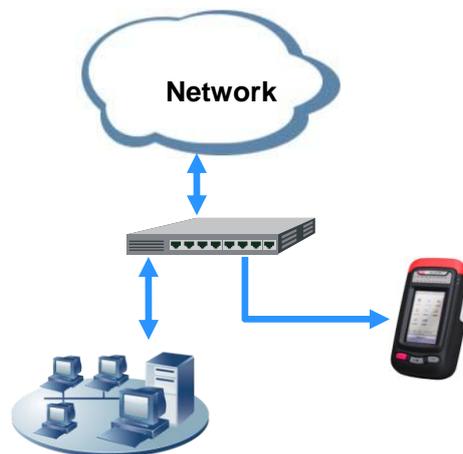


Figure 5.10.4 Traffic Statistics of Watching



Figure 5.10.5 Traffic Cooperate Mode

### 5.10.2 RFC2544 Setting

### 5.10.3 RFC2544 Test

RFC2544 performance test carries out the standard test of network equipment according to RFC2544 protocol. RFC2544 test items include throughput test, time delay test, packet loss rate test and “back-to-back” frame buffer test.

RFC2544 performance test can work and show result by operating [**Start/Stop**] and [**Display**].

**[Start/Stop]:** Start or Stop perform RFC2544 test.

**[Display]:** To show the test results and processing information, as is shown in figure 5.10.6.

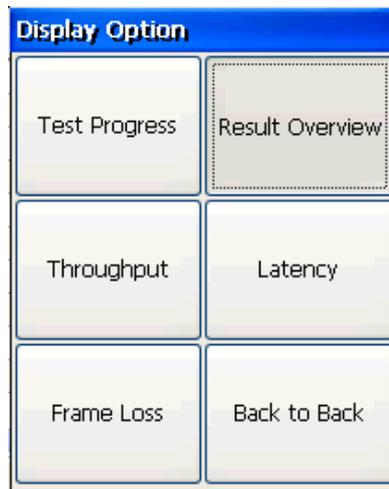


Figure 5.10.6 RFC2544--Display

RFC2544 test includes 6 test page layout, Test Progress, Result Overview, Throughput, Latency, Frame Loss and Back to Back.

#### 5.10.3.1 Test Progress

Test progress page is used to show real-time RFC2544 test status, test items and correlative test

data, as is shown in figure 5.10.7.

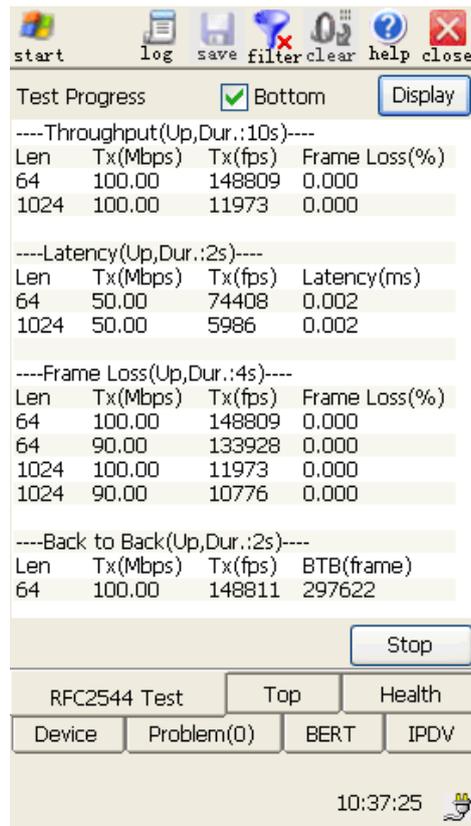


Figure 5.10.7 RFC2544—Test Progress

Different test information will be shown in the process pages as follows:

1. **Throughput:** Show the test direction, test cycle, send traffic(Mbps), send fps, loss rate(%).
2. **Latency:** Show the test direction, test cycle, send traffic(Mbps), send fps, latency(ms).
3. **Loss rate:** Show the test direction, test cycle, send traffic(Mbps), send fps, loss rate(%).
4. **Back-to-back:** Show the test direction, test cycle, send traffic(Mbps), send fps, back –to-back frame numbers.

### 5.10.3.2 Result Overview

[Result Overview] page is used to show the information of the final data results, threshold results etc. It can also show the real-time test process of RFC2544 test, as is shown in figure 5.10.8.

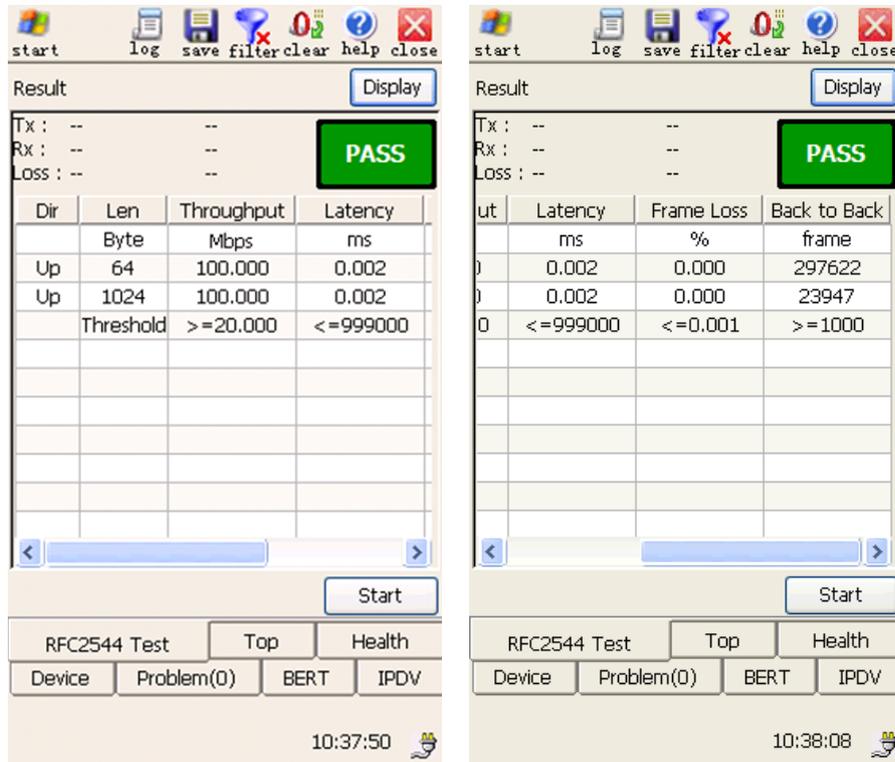


Figure 5.10.8 RFC2544 test—Result Overview



1. When some test item enables the threshold, threshold value will be shown in the threshold row.
2. When “/” is shown in threshold row, it means that the threshold is disabled.
3. When “--” is shown, it means that the test item isn’t started or the test results is of no effect.
4. When “\*” is shown before the test results data, it means that the results are not satisfy the threshold range which you set.
5. When the results satisfy all the test threshold you set, the top right corner will turn

green and “PASS”, otherwise it will turn red and “FAILED”.

- When the test is running, the top right corner will show sending frames, receiving frames and loss frames.

### 5.10.3.3 Throughput

Throughput page is used to show the throughput results of RFC2544 test, the parameter settings please refer to “**Throughput**” in “**RFC2544 Setting**”(5.6.2.1), as is shown in figure 5.10.9.



Figure 5.10.9 RFC2544 Test--Throughput

#### Histogram:

Throughput histogram is used to show the connection between the test frame and the frame rate. X-axes shows the test frame length, Y-axis shows the test frame rate (fps) with index. The red bar means the actual test frame rate (fps), and the green bar means the theoretical frame rate.

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**Results:**

1. **[Up]/[Down]:** Only used when the test mode of RFC2544 is “Remote” and “Up/Down” is selected. To show the throughput test results page in up direction when **[Up]** is selected, to show the throughput test results page in down direction when **[Down]** is selected.
2. **[Dir.]:** Display throughput test’s direction.
3. **[Frame length]:** Display test frame length.
4. **[Theoretic] [Actual]:** Display theoretic sending frame rate and actual frame rate of different frame length.
5. **[Theoretic L1] [Actual L1]:** Display theoretic sending traffic and actual traffic which you test.
6. **[Theoretic L2] [Actual L2]:** Display theoretic sending data traffic and actual data traffic which you test.

#### **5.10.3.4 Latency**

To show the latency test results of RFC2544, the parameter settings please refer to “**Latency**” in “**RFC2544 Setting**”(5.6.2.2), as is shown in figure 5.10.10.



Figure 5.10.10 RFC2544 Test--Latency

### Histogram:

Latency histogram is used to show the connection between the test frame and the frame latency. X-axis shows the test frame length, Y-axis shows the latency with index. The red bar means the actual test frame minimum latency, and the green bar means the actual test frame average latency. The yellow bar means the actual test frame maximum latency.

### Results:

1. **[Dir]:** Display latency test's direction.
2. **[Frame Length]:** Show the frame length of latency test.
3. **[Min.(ms)/Avg.(ms)/Max.(ms)]:** Show the maximum, minimum, average time delay value of different frame length, the unit is millisecond.

### 5.10.3.5 Frame Loss

To show the loss rate test results of RFC2544, the parameter settings please refer to “**Loss Rate**” in “**RFC2544 Setting**”(5.6.2.3), as is shown in figure 5.10.11.

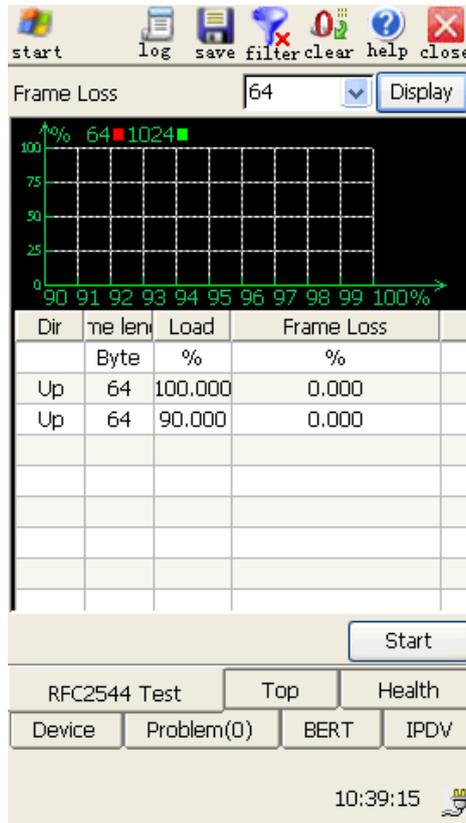


Figure 5.10.11 RFC2544 Test--Loss Rate

#### Graph:

Loss rate test graph is used to show the connection between the transmission load and the test network loss rate. X-axes shows the transmission load(%), Y-axes shows the loss rate(%), loss rate of different frame length will be shown in the graph with different colors.

1. **[Up]/[Down]**: Only used when the test mode of RFC2544 is “Remote” and “Up/Down” is selected. To show the loss rate test results page in up direction when **[Up]** is selected, to show the loss rate test results page in down direction when **[Down]** is selected.

2. **[Dir.]:** Display test direction of package loss test.
3. **[Frame Length]:** Display test frame length of package loss rate test, select different frame length from drop-down list box at the top of graph.
4. **[Load(Mbps)]:** Display loss test's sending load of different frame length.
5. **[Loss(%):]** Display package loss rate of different frame length with the corresponding test load.

### 5.10.3.6 Back To Back

To show the back-to-back test results of RFC2544, the parameter settings please refer to “Back To Back” in “RFC2544 Setting”(5.6.2.4), as is shown in figure 5.10.12.

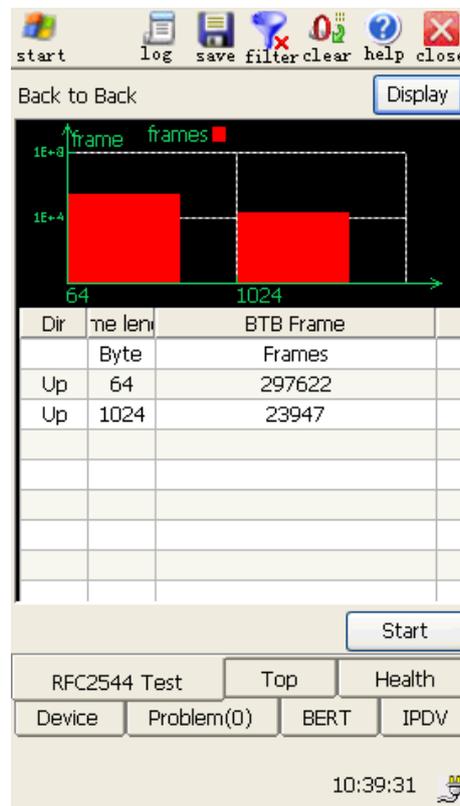


Figure 5.10.12 RFC2544 Test—Back to back

#### Histogram:

Back-to-back histogram is used to show the connection between the test frame and the

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corresponding maximum transmission data. X-axis shows the test frame length, Y-axis shows the capacity of buffer frames. The red bar means the buffer frames of different frame length.

**Results:**

1. **[Up]/[Down]:** Only used when the test mode of RFC2544 is “Remote” and “Up/Down” is selected. To show the “back-to-back” test results page in up direction when **[Up]** is selected, to show the “back-to-back” test results page in down direction when **[Down]** is selected.
2. **[Dir.]:** Display test direction of back-to-back test.
3. **[Frame Length]:** Display test frame length of back-to-back test.
4. **[Buffer(frames)]:** Display back-to-back test’s buffer frames of different frame length.

### 5.10.3.7 Topological Structure

There are 3 modes for RFC2544 test: remote mode, loop-back mode and Port2 Cooperate mode. It can cooperate with another tester or other products of this company. Their topological structures are shown in figure 5.10.13, figure 5.10.14 and figure 5.10.15.

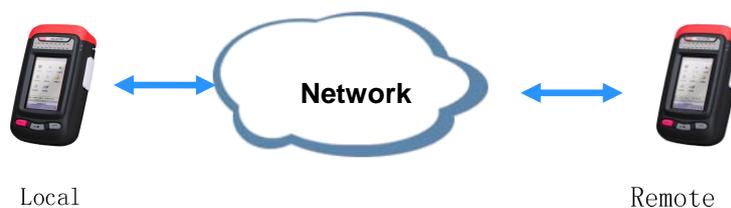


Figure 5.10.13 Remote Mode

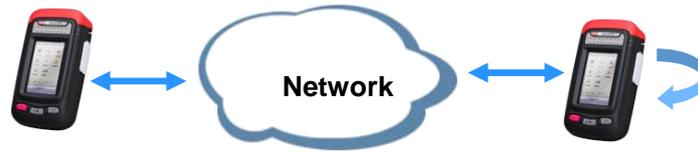


Figure 5.10.14 Loopback Mode

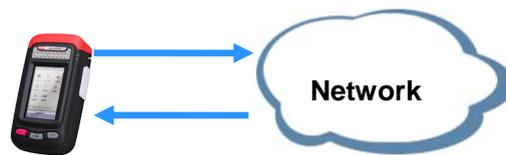


Figure 5.10.15 Port2 Cooperate Mode

#### 5.10.4 Y.1564 Test

Y.1564 test carries out the standard test of network equipment according to Y.1564 protocol. Y.1564 test includes service configuration test and service performance test, parameters of which refer to chapter 5.7.

Y.1564 test can work and show result by operating [**Start/Stop**] and [**Display**].

**[Start/Stop]:** Start or Stop Y.1564 test.

**[Display]:** To show the test results and processing information, as is shown in figure 5.10.16.

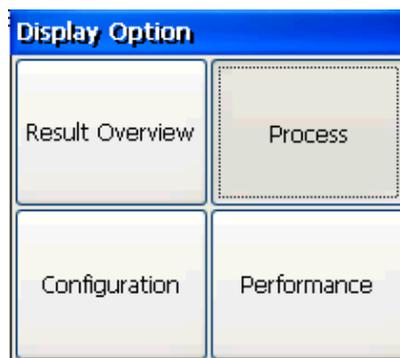


Figure 5.10.16 Y.1564--Display

RFC2544 test includes 4 test page layout, Result Overview, Process, Configuration and Performance.

### 5.10.4.1 Process

Test progress page is used to show real-time Y.1564 test status, test items and correlative test data, as is shown in figure 5.10.17.

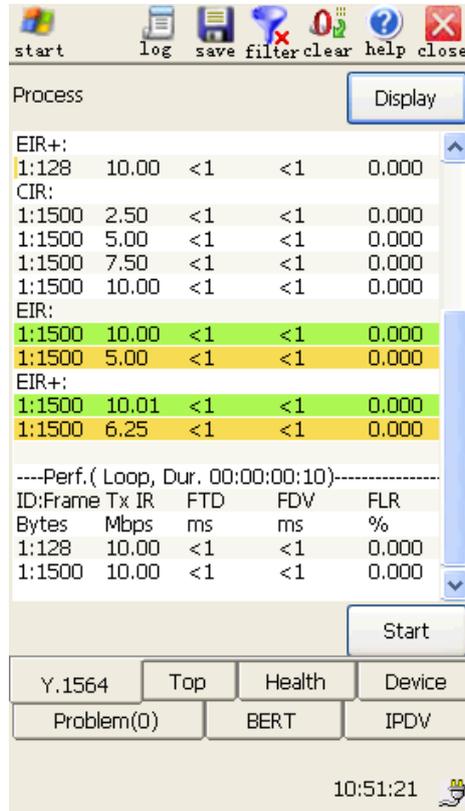


Figure 5.10.17 Y.1564—Process information



When Color Aware is enabled, process information of green and yellow result will be distinguished by color green and yellow.

### 5.10.4.2 Result Overview

[Result Overview] page is used to show the information of the final data results, threshold results etc. It can also show the real-time test process of Y.1564 test, as is shown in figure 5.10.18.

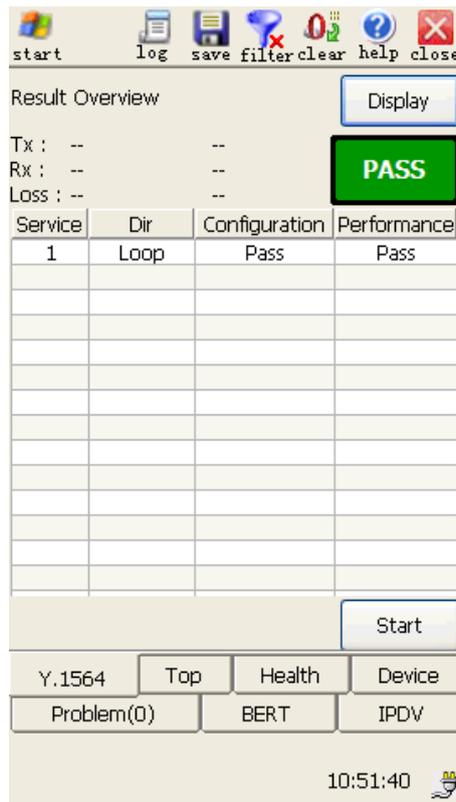


Figure 5.10.18 Y.1564—Result Overview



1. When some test item enables the threshold, threshold value will be shown in the threshold row.
2. When “/” is shown in threshold row, it means that the threshold is disabled.
3. When “--” is shown, it means that the test item isn’t started or the test results is of no effect.
4. When “\*” is shown before the test results data, it means that the results are not satisfy the threshold range which you set.
5. When the results satisfy all the test threshold you set, the top right corner will turn green and “PASS”, otherwise it will turn red and “FAILED”.
6. When the test is running, the top right corner will show sending frames, receiving

frames and loss frames.

### 5.10.4.3 Service Configuration

Service configuration page is used to show configuration test result of all the services, as is shown in figure 5.10.19.

Stage	Dir	Name	Length	Tx IR	Rx IR	FTD (Min/Avg/Max)	FDV (Min/Avg/Max)	FLR
--	--	Bytes	Mbps	Mbps		ms	ms	%
SAC	Loop	--	--	--	--	5	5	0.001
CIR	Loop	128	2.50	2.50	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
CIR	Loop	128	5.00	5.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
CIR	Loop	128	7.50	7.50	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
CIR	Loop	128	10.00	10.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
EIR	Loop	128	10.00	10.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
EIR	Loop	128	5.00	5.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
EIR+	Loop	128	10.00	10.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
EIR+	Loop	128	6.25	6.25	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
CIR	Loop	1500	2.50	2.50	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
CIR	Loop	1500	5.00	5.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
CIR	Loop	1500	7.50	7.50	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
CIR	Loop	1500	10.00	10.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
EIR	Loop	1500	10.00	10.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
EIR	Loop	1500	5.00	5.00	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000
EIR+	Loop	1500	10.01	10.01	<1/<1/<1	<1/<1/<1	<1/<1/<1	0.000

Figure 5.10.19 Y.1564—Service configuration

[Service ID]: to select service ID to show corresponding test result.

### 5.10.4.4 Service Performance

Service performance page is used to show performance test result of all the services, as is shown in figure 5.10.20.

Service	Dir	Name	Length	Tx IR	Rx IR	FTD (Min/Avg/Max)	FDV (Min/Avg/Max)	FLR	AVAIL	Unavail
--	--	Bytes		Mbps	Mbps	ms	ms	%	%	s
1	Loop		128	10.00	10.00	<1/<1/<1	<1/<1/<1	0.000	100.0	0
1	Loop		1500	10.00	10.00	<1/<1/<1	<1/<1/<1	0.000	100.0	0

Figure 5.10.20 Y.1564—Service Performance

### 5.10.4.5 Topological Structure

There are 4 modes for Y.1564 test: remote mode, loop-back mode, Port2 Cooperate mode and Port2 Loop mode. It can cooperate with another 8130A tester. Their topological structures are shown in figure 5.10.21, figure 5.10.22, figure 5.10.23 and figure 5.10.24.

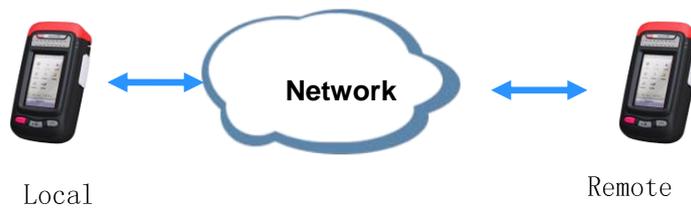


Figure 5.10.21 Remote Mode



Figure 5.10.22 Loop back Mode

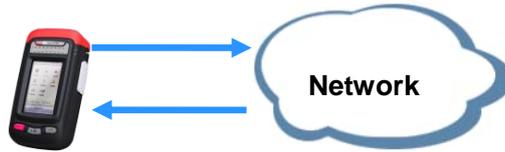


Figure 5.10.23 Port2 Cooperation Mode

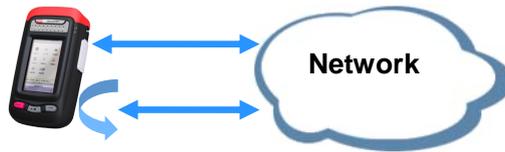


Figure 5.10.24 Port2 Loop Mode

## 5.10.5 Cooperation

Cooperation is used to cooperate remote tester to test correlative performance test. Cooperation has 2 mode, Local Cooperation and Remote Cooperation(Automatic Cooperation), as is shown in figure 5.10.25.



Figure 5.10.25 Cooperation Mode Select

Local Cooperation starts the cooperation function of local tester.

Remote Cooperation starts the cooperation function of remote tester according to IP address.

### 5.10.5.1 Basic Function

Two testers will be needed for far distance tests, in this case one tester should work in the

cooperation mode to coordinate with the other tester for relevant tests. The cooperation function is mainly used to coordinate with remote tester to carry out the performance test, as shown in figure 5.10.26.

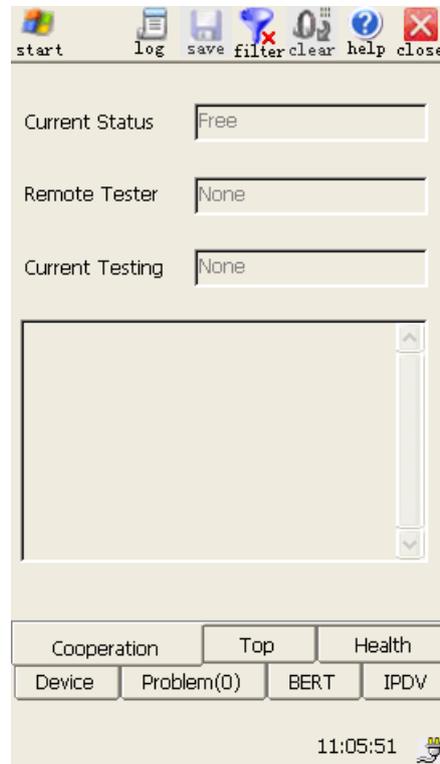


Figure 5.10.26 Cooperation

1. **[Current Status]:** Show whether the current status is free or coordinating.
2. **[Remote Tester]:** Show the remote tester IP.
3. **[Current Testing]:** Show current test program when remote tester connecting to this one.

### 5.10.5.2 Topological Structure

Mutual cooperation's topological structure is shown in figure 5.10.27.



Figure 5.10.27 Mutual Cooperation Topology

### 5.10.5.3 Automatic Cooperation

Automatic cooperation is used to connect remote tester and start cooperation function of remote tester to test traffic test, RFC2544 test or Y.1564 test etc.

Automatic cooperation has 2 mode to connect remote tester, manual connect and auto scan, as is shown in figure 5.10.28.

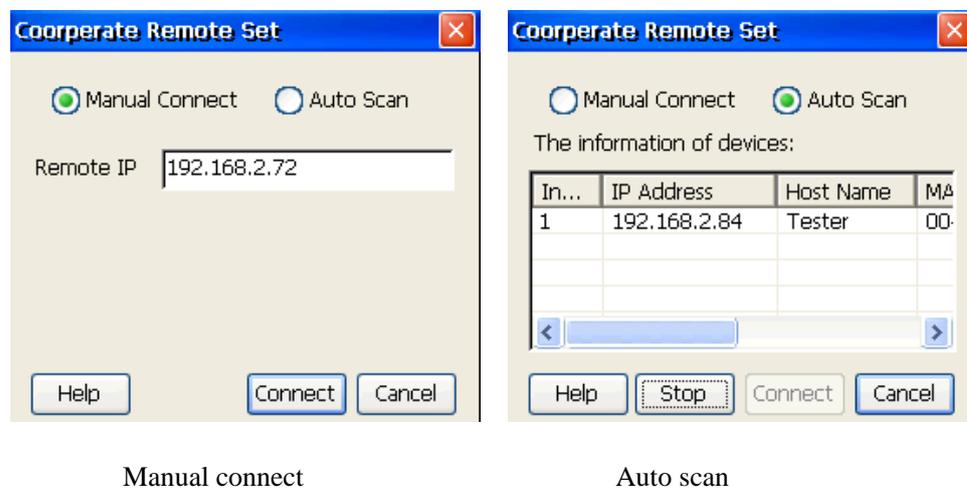


Figure 5.10.28 Automatic Cooperation

1. **[Manual Connect]:** to be used in known IP address.
2. **[Auto Scan]:** to scan testers with the same network segment as the local tester in the network.
3. **[Remote IP]:** to input remote IP address to connect.
4. **[Scan]:** to scan / stop scanning in the network.
5. **[Connect]:** to connect remote according to IP.
6. **[Cancel]:** to cancel current operation.

The information of scanning devices includes IP address, Host Name, Mac, Model and Using

---

Status.

When automatic cooperation starts, the icon  of local tester and remote tester will show. Click , information of remote tester show in a box as follows.



Figure 5.10.29 Remote tester information

Information of remote tester has host name, model and IP address. Click [Disconnect] to disconnect the connection. Click also function icon or corresponding menu item to stop the function.

### 5.10.6 Loopback

Loopback function sends the receiving data to the remote tester according to corresponding layer. Loopback has 2 mode, Local Loopback and Remote Loopback (Automatic Loopback), as is shown in figure 5.10.30.

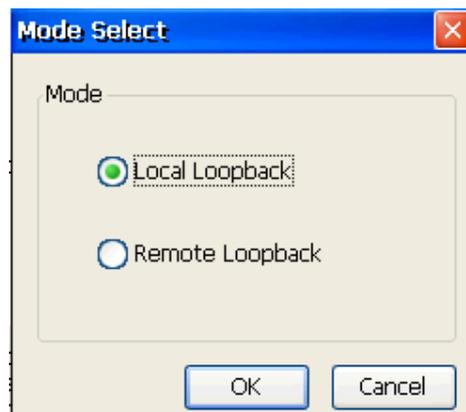


Figure 5.10.30 Loopback Mode Select

Local Loopback starts the loopback function of local tester.

---

Remote Loopback starts the loopback function of remote tester according to IP address.

### 5.10.6.1 Basic Function

Two ports of 8130A tester both start loopback function and set layer to realize network loopback, as is shown in figure 5.10.31.

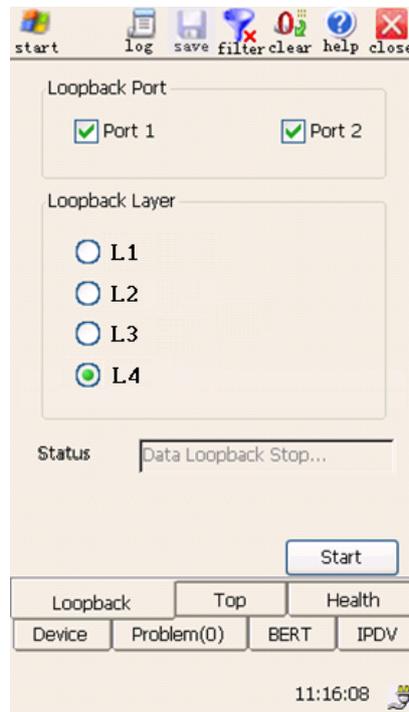


Figure 5.10.31 Local Loopback

1. **[Loopback Port]:** Select loopback port. If no port is selected, loopback will not start.
2. **[Loopback Layer]:** L1,L2,L3 and L4 can be selected. For L1, the received packet from the Rx would be sent from Tx directly; For L2, the received packet would be exchanged source and destination MAC address first and then be sent away; For L3, the received packet would be sent away after exchanged both source and destination MAC and IP address, For L4, the received packet would be sent away after exchanged all of source and destination MAC and IP address and PORT.
3. **[Current Status]:** Display the loopback status of current port, including loopback running and loopback stopped.

4. **[Start]:** Start/Stop data loopback. When loopback starts, all the parameters can't be set.



When a tester starts data loopback or work in through mode, receiving FCS error is discarded.

### 5.10.6.2 Topological Structure

Data loopback's topological structure is shown in figure 5.10.32.

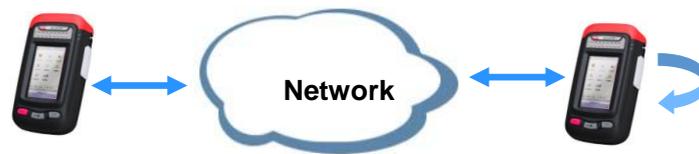
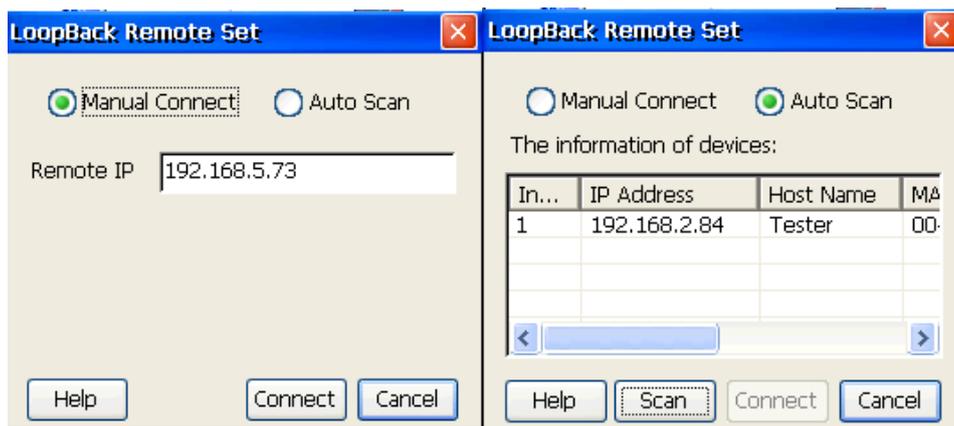


Figure 5.10.32 Loopback Topology

### 5.10.6.3 Automatic Loopback

Automatic loopback is used to connect remote tester and start loopback function of remote tester to test traffic test, RFC2544 test or Y.1564 test etc.

Automatic loopback has 2 mode to connect remote tester, manual connect and auto scan, as is shown in figure 5.10.33.



Manual connect

Auto scan

Figure 5.10.33 Automatic Loopback

- 
1. **[Manual Connect]:** to be used in known IP address.
  2. **[Auto Scan]:** to scan testers with the same network segment as the local tester in the network.
  3. **[Remote IP]:** to input remote IP address to connect.
  4. **[Scan]:** to scan / stop scanning in the network.
  5. **[Connect]:** to connect remote according to IP.
  6. **[Cancel]:** to cancel current operation.

The information of scanning devices includes IP address, Host Name, Mac, Model and Using Status.

When automatic loopback starts, the icon  of local tester and remote tester will show. Click , information of remote tester show in a box as follows.



Figure 5.10.34 Remote tester information

Information of remote tester has host name, model and IP address. Click **[Disconnect]** to disconnect the connection. Click also function icon or corresponding menu item to stop the function.

### 5.10.7 Download Speed

Download speed is used for testing connectivity and download speed of the server. It supports both FTP and HTTP download test.

For FTP download and HTTP download test, the steps are as following, as shown in figure 5.10.35.

1. Set **[Server]**, **[Port]**, **[User]**, **[PWD]** (password), **[Threads]** parameters.
2. Click **[Cont.]** to connect to the server, and you can go to the next step after connecting to the server successfully.
3. After connecting to the server, you can choose a file from the list or browsing WEB through IE for speed test, and before downloading, **[Threads]** can also be changed.
4. Click **[Dld.]** to start download speed test.



1. It is advised that you choose a file with size of greater than 10M to download, especially in case of multi-thread download, otherwise the speed value can not be sampled correctly.
2. If download speed test is stopped during the process, please wait for a moment patiently until it is completed.
3. For some WEB servers, multi-thread download speed is probably equal to single-thread.

The figure shows three sequential screenshots of the software interface, illustrating the process of connecting to a server and starting a download.

- Not Connected:** The interface shows the 'Addr' field set to 192.168.2.215, 'Port' to 21, 'User' to 123, and 'PWD' to \*\*\*\*. The 'Thr.Num.' is set to 5. The 'Status' is 'No Connection'. The 'Download' button is highlighted.
- Connected:** The 'Status' has changed to 'Connect succeeded'. The 'Download' button is now highlighted.
- Download:** The 'Status' is 'Downloading/testForBeyond4G.rar..'. The 'Finished' progress is shown as 362,761KB 7%. The 'Download' button is now 'Stop'.

Not Connected

Connected

Download

---

### Figure 5.10.35 Download Speed Test

The description of control is as follows:

1. **[Addr]:** Input server IP or URL, record of latest 5 times can be kept.
2. **[Port]:** Input server port Number. For FTP, the default value is 21; for HTTP, the default value is 80, the port is bond with the server address.
3. **[User]:** Input server name. When the server address is switched, anonymous name will be filled in automatically, and record of latest 5 times can be kept. For HTTP, ignore this.
4. **[PWD]:** Input login password, which can be shown bond with the name. For HTTP, ignore this.
5. **[Thr.Num.]:** Input expected thread number for download speed test, supporting maximum 10 threads, and 4 to 6 thread is better.
6. **[Act.Thr.Num.]:** Show actual connected thread number in download test.
7. **[Cycle]:** The time interval of speed data sampling and decides the points density of speed curve in the report, and 1s, 5s, 10s, 20s and 30s can be chosen.
8. **[Avg./Cur./Max./Min.]:** Show real-time download speed such as average speed, current speed, maximum speed and minimum speed.
9. **[Finished]:** Show current download size (unit is B or KB) and percentage.
10. **[Path]:** Show the path of currently visited folder. You can choose one from the list of paths recorded recently and the path will be changed. For HTTP, ignore this.
11. **[Status]:** Show connecting status in real time.
12. **[HTTP]:** Be in HTTP download mode if selected, otherwise in FTP download mode.
13. **[Connect /Cancel]:** Connect or disconnect to the server.
14. **[Download/Stop]:** Start or stop testing.

---

### 5.10.8 High Speed Ping

The tester provides high-speed Ping test, it can simulate 1000M ping traffic sending at most, it supports Ping two destination IP address at one time. It is used for testing Ethernet bandwidth and latency.

In this interface, you can set the public parameters of the test, such as: Bytes, Packets, TTL, Timeout, Packet speed.

1. **[IP1]:** Set destination IP address one when **[Enable]** is selected.
2. **[IP2]:** Set destination IP address two when **[Enable]** is selected.
3. **[Bytes]:** Set the Ethernet packets size, range is 64~1518 bytes.
4. **[Packets]:** Set the number of echo requests, range is 0~9999999. When set the value "0", it won't stop sending packets until you click **[Stop]** button.
5. **[TTL]:** Set the "time to live" value of IP layer, range is 1~255.
6. **[Timeout]:** Set timeout, range is 100~6000ms.
7. **[Speed]:** Set the number of echo requests or traffic per second by select different unit. If packet speed is selected, the current ping traffic will be shown automatically, according to **[Bytes]**. If traffic speed is selected, the current ping packets number will be shown automatically, according to **[Bytes]**.
8. **[Start/Stop]:** Start or Stop ping test.

The interface is shown in figure 5.10.36.

IP1	192.168.2.30	<input type="checkbox"/> Enable
IP2	192.168.2.84	<input checked="" type="checkbox"/> Enable
Bytes	100	Packets 100666
TTL	255	Timeout 100ms
Speed	10	pkt/s 0.010Mbps

Stat. Item	Des. IP2
Addr.	192.168.2.84
Tx Packets	523
Rx Packets	522
Err. Packets	0
Loss Packets	1
Lost Rate	0.191%
Res. Time Avg	3.526
Res. Time Max	6.556
Res. Time Min	0.542

High Speed Ping		Top	Health
Device	Problem(1)	BERT	IPDV

Figure 5.10.36 High Speed Ping

Test Results includes Addr. Tx Packets, Rx Packets, Err. Packets, Loss Packets, Res. Time Avg., Res. Time Max and Res. Time Min.

1. **[Tx Packets]:** Show the current number of echo requests.
2. **[Rx Packets]:** Show the current number of reply packets.
3. **[Err. Packets]:** Show the current number of error packets.
4. **[Loss Packets]/ [Loss Rate(%)]:** Show the current number of loss packets/loss rates.
5. **[Avg.(ms) ]/ [Max.(ms) ]/ [Min.(ms) ]:** Show the current average response time/maximum response time/minimum response time.



When **[C-VLAN]/[S-VLAN]/[MPLS#1,#2,#3]** is enabled, ping test will contains C-VLAN or S-VLAN or MPLS tags.

---

## 5.10.9 Server Performance

This tool is used for testing the response time of application layer server, including maximum, minimum, average time and “no response” times.

### 5.10.9.1 DNS Service

To test the response time of DNS server’s domain resolution, as is shown in figure 5.10.37.

Response time(ms)	MAX	MIN	AV/G	No Response
Domain resolution	25813	<1	53	0

Figure 5.10.37 Server Performance for DNS

1. **[Addr.]:** Set IP address of DNS server, which “Netscan” function scans .
2. **[Port]:** Set Port No. of DNS service.
3. **[Times]:** Set times of repeated test.
4. **[Domain]:** Set domain name to be checked.



1. The default port no. of DNS service is 53.

2. If the response is successful, the resolved IP address of domain name host will be displayed on the lower left quarter test status.

### 5.10.9.2 POP3 Service

To test the response time of POP3 mail server, including user authentication, password authentication, status display, search list and no operation command etc, as is shown in figure 5.10.38.

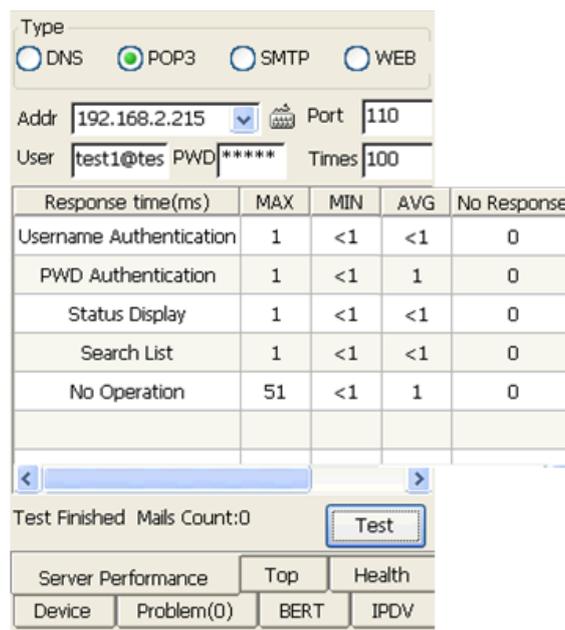


Figure 5.10.38 Server Performance for POP3

1. **[Addr]:** Set IP address of POP3 server, the found in “Netscan” or the DNS host address by checking DNS service can be used.
2. **[Port]:** Set port No. of POP3 service.
3. **[Times]:** Set times of repeated test.
4. **[User]:** Set username of login account.
5. **[PWD]:** Set password of login account.



The default port No. of POP3 service is 110.

### 5.10.9.3 SMTP Service

To test the response time of SMTP mail server, including HELLO, MAIL FROM, RCPT TO, DATA and NOOP command etc., as is shown in figure 5.10.39.

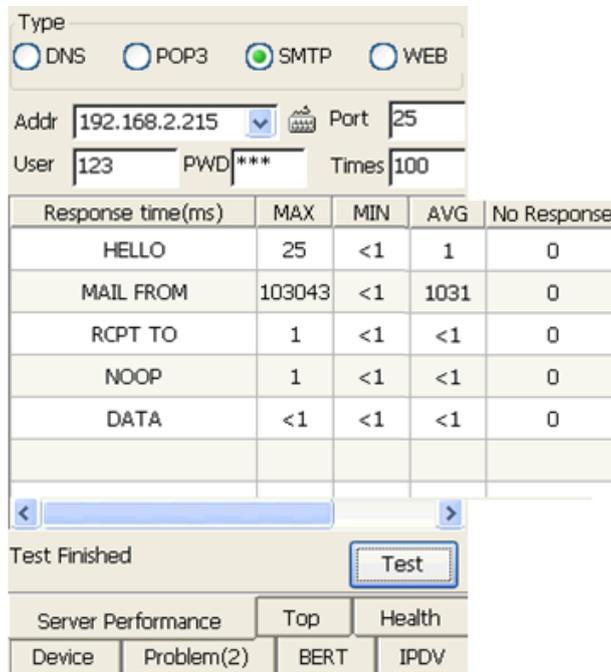


Figure 5.10.39 Server Performance for SMTP

1. **[Addr]:** Set IP address of SMTP server, the found in “Netscan”, or the DNS host address by checking DNS service can be used.
2. **[Port]:** Set port No. of SMTP service.
3. **[Times]:** Set times of repeated test.
4. **[User]:** Set user name of login account.
5. **[PWD]:** Set password of login account.

 : The default port No. of SMTP service is 25.

### 5.10.9.4 WEB Service

To test response time of visiting WEB server, including response time of HEAD and GET request,

as shown in figure 5.10.40.

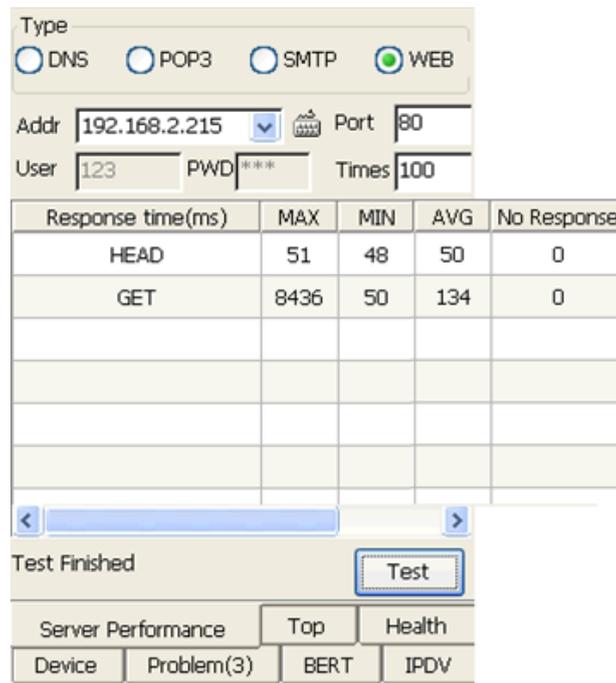


Figure 5.10.40 Server Performance for WEB

1. **[Addr.]:** Set IP address of the WEB server, which can be one of found devices in “Netscan”, or the DNS server.
2. **[Port]:** Set port number of WEB service.
3. **[Times]:** Set test repeat times.

 : The default port No. of WEB service is 80.

## 5.11 Network Tools

Network Tools include 4 modules as follows: Ping, Trace-route, Web Browser and PPPoE.

### 5.11.1 Ping

The module realizes basic ping function, as is shown in figure 5.11.1.

IP	Tx/Rx/Lost	Min/Max/Avg
192.168.2.215	4/4/0	51/154/77.25
192.168.2.213	4/0/4	0/0/0
192.168.2.84	4/4/0	51/154/77.00

No.	Timeout(ms)	TTL

Ping   Top   Health   Device  
 Problem(8)   BERT   IPDV

Figure 5.11.1 Ping Test

**[Start/Stop]:** Start or Stop ping test.

**[Setting]:** Set parameters of ping test. The parameters are shown in figure 5.11.2.

**Ping Setting**

Address | Public

IP Addr. Range

192.168.1.25 To 35

Specify IP Addr.

Addr.1 192.168.2.215

Addr.2 192.168.2.213

Addr.3 192.168.2.84

Addr.4 192.168.1.223

Addr.5 192.168.1.100

Addr.6 192.168.1.2

**Ping Setting**

Address | Public

Iteration  Specify 4

Series(1000)

Timeout(ms)  Specify 200

Default(100)

Interval(ms)  Specify 200

Default(100)

Data Len.  Specify 200

Default(100)

**Address**

**Public Parameters**

Figure 5.11.2 Ping Test Parameters

**[Address]:** Set destination IP address.

- 
- a) **[IP Addr. Range]:** Set destination IP range. When ping test starts, ping module will send data to each IP in the range.
  - b) **[Specify IP Addr.]:** Specify destination IP address and support 6 IP at most. When ping test starts, ping module will send data to each specified IP.

**[Public]:** Set ping parameters.

- a) **[Iteration]:** Set number of ping. Two modes can be selected, Specify and Series. Specify means that sending count is specified, range 0~1000. By Series, test will send 1000 continuously.
- b) **[Timeout(ms)]:** Set time out, including Specify (defined time, range 10~9999ms), and Default (100ms).
- c) **[Interval(ms)]:** Set interval time between ping sending, including Specify (defined time, range 1~9999ms), and Default (100ms).
- d) **[Data Len.]:** Set length of data loaded by sending frame, including Specify (defined length, range 0~4000 bytes), and Default (100ms).

### 5.11.2 Trace-Route

Trace-route realized the basic function of route tracing tool like “Tracer”, showing the IP addresses of routers and the delay time of each hop, through which the packets arrive at the target host, as is shown in figure 5.11.3.

---

Target
 Addr
  Hostname

Max.Hops

192.168.5.195

5

No.	Hops(IP)	Latency(ms)
1	*	time out
2	*	time out
3	*	time out
4	*	time out
5	*	time out

Traceroute Test Finished

Start

Traceroute
Top
Health

Device
Problem(8)
BERT
IPDV

Figure 5.11.3 Trace-Route

1. **[Target]:** Set the destination host's address or name.
2. **[Max Hops]:** Set the maximum hops of the hop router.
3. **[Start/Stop]:** Start or stop route tracking test.

### 5.11.3 Web Browser

The tester supports web browser in LAN and PPPoE, as is shown in figure 5.11.4.



Figure 5.11.4 Web Browser

Connect to LAN through port1, set IP address and DNS of port1, enter into “Network Tools→ Web Browser” and start IE explorer for browsing web.

If LAN uses deputy internet, you need to set deputy parameter. Click explorer “View → Internet Options” and set deputy server IP and port, as is shown in figure 5.11.5.



Figure 5.11.5 IE Explorer Setting



1. Suggest to open 1~2 pages for WEB browsing.
2. It will be slow when the contents are overfull.



: When too many pages are opened, the internal storage will be deficient.

## 5.11.4 PPPoE

### 5.11.4.1 Basic Function

Dial-up test and bandwidth test after successful dial-up, as is shown in figure 5.11.6.



Figure 5.11.6 PPPoE Dial-up

1. **[User name]:** Set the username for Dial-up.
2. **[Password]:** Set the password.
3. **[Save Password]:** Save current password for next Dial-up.
4. **[Dialup]:** Start dial-up test.
5. **[Cancel]:** Stop dial-up test.

---

After PPPoE dial-up is successful, the connective status will be shown as “

#### 5.11.4.2 Topological Structure

PPPoE’s topological structure is shown in figure 5.11.7.

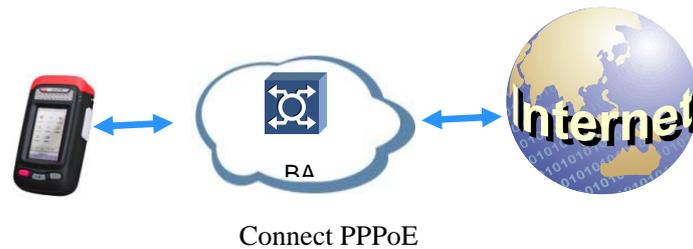


Figure 5.11.7 PPPoE Topology

### 5.12 Network Analysis

Network analysis supports tools used to analyze network data, Nmap, Packet Capture and SNMP.

#### 5.12.1 Nmap

##### 5.12.1.1 Basic Function

This tool is used for finding the host equipment, checking its IP address and recognizing its type within a certain range. As is shown in figure 5.12.1.

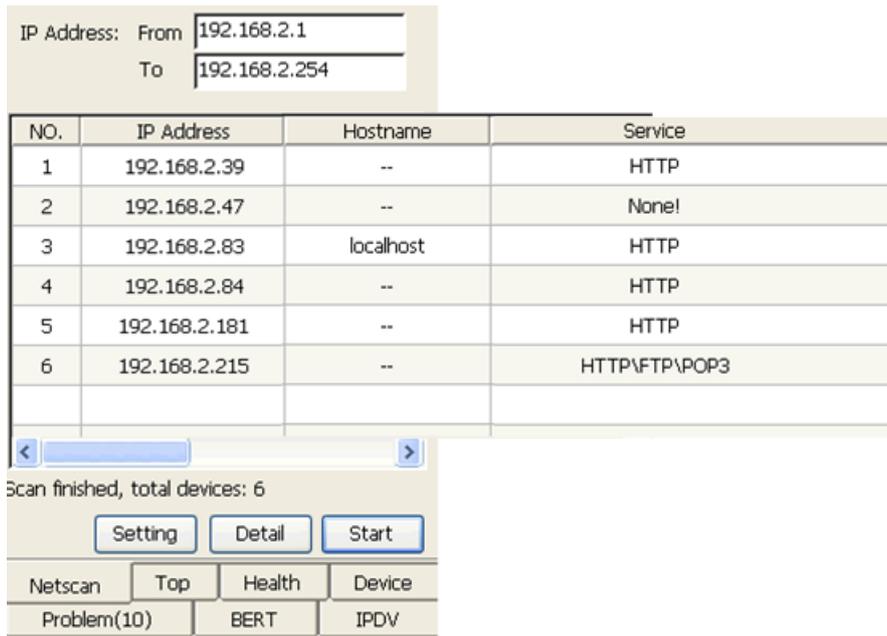


Figure 5.12.1 NetScan

1. **[IP Address From/To]:** Set the range of IP address, the IP address and host IP address which you set should be in the same network segment.
2. **[Result]:** Display scanning results, including No., Host name, IP address, Service. And Display the overall situation of scanning and scanning information under the result list.
3. **[Setting]:** Set the scanning network service, including HTTP, POP3, FTP, IMAP, DHCP, DNS, SMTP and customized TCP/UDP port number, as is shown in figure 5.12.2.

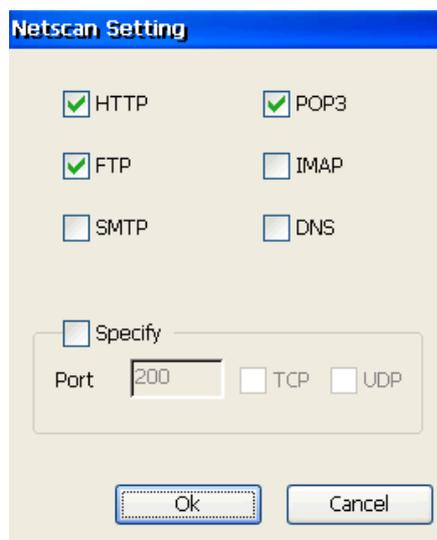


Figure 5.12.2 Netscan Setting

4. **[Details]:** Browse the details, including: equipment type, host name, IP address, MAC address, service and SNMP, as is shown in figure 5.12.3.

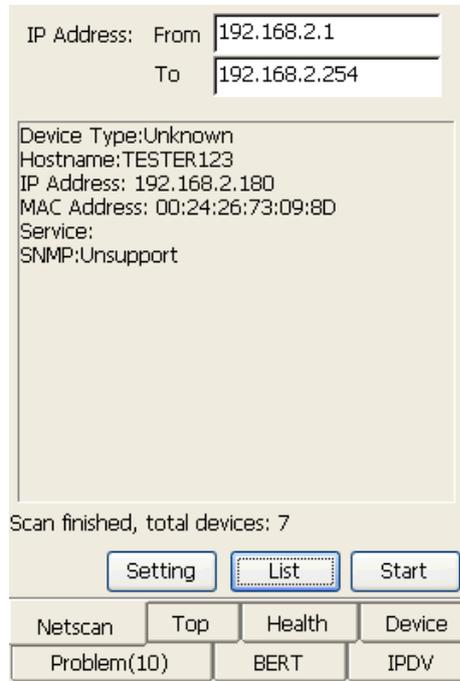


Figure 5.12.3 Netscan Detail

5. **[Start/Stop]:** Start or stop network scanning test.



Service port number can be changed. The default value is the advised port in standard. The customized part in network scanning setting is this function's self-owned information.

### 5.12.1.2 Topological Structure

Topological structure of network scanning is shown as in figure 5.12.4.

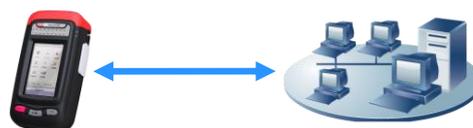


Figure 5.12.4 Netscan Topology

## 5.12.2 Packet Capture

### 5.12.2.1 Basic Function

This function is used to capture data through port1 from tested network, and analyze, show these data. User can analyze these data to estimate which network equipments have something the matter. The interface is shown in figure 5.12.5.

The screenshot shows a packet capture window with a 'Cycle' checkbox at the top left, which is currently unchecked. Below it is a table with the following data:

Index	Port	Protocol	Length	Src. IP/MAC	Dest. IP/MAC	Err type
1	1	UDP	80	192.168.50.1	224.0.0.2	
2	1	UDP	90	192.168.2.1	224.0.0.9	
3	1	UDP	80	192.168.50.1	224.0.0.2	
4	1	ARP	64	00-24-20-5b-47-ae	ff-ff-ff-ff-ff-ff	
5	1	UDP	80	192.168.50.1	224.0.0.2	
6	1	UDP	110	192.168.5.1	224.0.0.9	
7	1	CDP	398	a4-0c-c3-1e-91-8f	01-00-0c-cc-cc-cc	
8	1	UDP	80	192.168.50.1	224.0.0.2	

Below the table, there is a 'Capturing Buffer Usage:1%' indicator and a 'Stop' button. At the bottom, there are tabs for 'Packet Capture', 'Top', and 'Health', and a row of buttons for 'Device', 'Problem(8)', 'BERT', and 'IPDV'.

Figure 5.12.5 Packet Capture

1. **[Cycle]:** Select the way of dealing with the full buffer. If the check box is selected, it means that the system will clear buffer when it is full. If not, when the buffer is full, the system will not capture data.
2. **[Result]:** Display information of captured packet, protocol, length, source IP/MAC, destination IP/MAC, error type and so on. If captured packet has FCS error tag, row of displaying current data will be marked with red color. If packet has other error tag, row is marked with yellow color.
3. **[Information]:** Display detail content of captured data packet with hexadecimal.

- 
4. **[Capture/Stop]:** Start or stop capturing.

### 5.12.2.2 Topological Structure

Topological structure of packet capture is shown as in figure 5.12.6.



Figure 5.12.6 Packet Capture Topological Structure

### 5.12.3 SNMP

SNMP module is used to query information of network equipments, exchange board, router, according to simple network management protocol. At present, the system supports 3 query function, basic information query, interface statistic query, service statistic query.

The controls of SNMP module are as following:

1. **[IP]:** Set IP address of tested equipment.
2. **[Community]:** Set name of tested equipment community.
3. **[Basic]:** Show result of basic information query.
4. **[Interface]:** Show result of interface statistic query.
5. **[Service]:** Show result of service statistic query.
6. **[Start/Stop]:** Start or stop querying.



1. Note that input community is case-sensitive and query authority.
2. The query items, basic, interface and service, use the same IP and community. Query result is shown by clicking corresponding button. But during testing, query items can't switch each

other.

### 5.12.3.1 Basic Information

Basic function is used to show information of system in tested equipment MIB, including system details, supported service and physical location, as is shown in figure 5.12.7.



Figure 5.12.7 SNMP basic query

### 5.12.3.2 Interface Statistic

Interface function is used to show information of interface in tested equipment MIB, including total, active and port browse, as is shown in figure 5.12.8.



Figure 5.12.8 SNMP Interface Query

Parameter name and value of each statistical interface are as following:

Parameter Name	Parameter Value
ifIndex	Interface index, between 1~ifNumber
ifDescr	Description of interface
ifType	Interface type
ifMtu	Interface MTU
ifSpeed	Speed, unit b/s
ifPhysAddress	Physical address. All '0' expresses no address.
ifNetAddress	IP of interface
ifNetMask	Subnet mask of interface
ifOperStatus	Status of current interface, 1=working, 2=no working, 3=test

ifInOctets	Received bytes, including framing byte.
ifOutOctets	Sending bytes, including framing byte.

1. **[Total]:** Show total interface count of queried equipment.
2. **[Active]:** Show interface count of queried activity.
3. **[Port Browse]:** List all the interface to show corresponding port information.

### 5.12.3.3 Service Statistic

Service function is used to show information of IP, TCP and UDP in tested equipment MIB, including IP statistic, TCP statistic and UDP statistic, as is shown in figure 5.12.9.

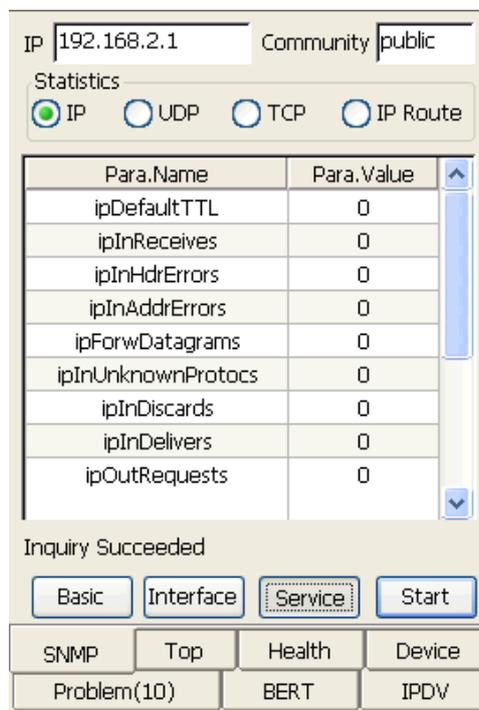


Figure 5.12.9 SNMP Service Statistic

Parameter name and value of each statistical interface are as following:

Statistics	Parameter Name	Parameter Value
IP	ipDefaultTTL	Default TTL value, when transfer layer does not

Statistic		support TTL.
ipInReceives		Count of IP data packet from all the interface
ipInHdrErrors		Discarded data packet with head error
ipInAddrErrors		Discarded data packet with wrong destination address
ipForwDatagrams		IP data packet that has be retransmitted at one time
ipInUnknownProtoocs		IP data packet with invalid protocol field sent to local
ipInDiscards		Receiving data packet is discarded as buffer is insufficient
ipInDelivers		IP data packet delivered to proper protocol module
ipOutRequests		IP data packet transferred to IP layer, not packet in ipForwDatagrams
ipOutDiscards		Discarded output data packet as buffer is insufficient
ipOutNoRoutes		Discarded data packet of finding no router
ipReasmTimeout		Max seconds for which received data packets are kept when waiting to reset.
ipReasmReqds		Count of received IP data packets that need resetting.
ipReasmOKs		Count of reset IP data packets
ipReasmFails		Count of resetting failed.
ipFragOKs		Count of IP data packets that have be burst successfully.
ipFragFails		Count of IP data packets that need bursting but can't burst as the sign of "no burst" is set.
ipFragCreates		Count of IP data packets that are generated by bursting.

<b>TCP Statistic</b>	tcpRtoMin	Minimum retransferring time out in milliseconds.
	tcpRtoMax	Maximum retransferring time out in milliseconds
	tcpMaxConn	Maximum TCP connection count. If the connection is dynamic, the value is -1
	tcpActiveOpens	Count of state changing from CLOSED to SYN_SENT
	tcpPassiveOpens	Count of state changing from LISTEN to SYN_RCVD
	tcpAttemptFails	Count of state changing from SYN_SENT or SYN_RCVD to CLOSED and from SYN_RCVD to LISTEN
	tcpEstabResets	Count of state changing from ESTABLISHED or CLOSE_WAIT to CLOSED
	tcpCurrEstab	Connection Count in ESTABLISHED or CLOSE_WAIT
	tcpInSegs	Total receiving data segments
	tcpOutSegs	Total sending data segments except for segments only with retransferring bytes.
	tcpRetransSegs	Total retransferring data segments
<b>UDP Statistic</b>	udpInDatagrams	Count of input UDP data packets
	udpNoPorts	Count of UDP data packets that are not sent to valid port
	udpInErrors	Count of receiving UDP data packets with error
	udpOutDatagrams	Count of output UDP data packets

In the IP routing table, value of routing protocol is as following:

<b>Value</b>	<b>Routing protocol</b>	<b>Value</b>	<b>Routing protocol</b>
<b>1</b>	Other	<b>8</b>	rip
<b>2</b>	Local	<b>9</b>	is-is
<b>3</b>	Netmgmt	<b>10</b>	es-is
<b>4</b>	Icmp	<b>11</b>	ciscoigrp
<b>5</b>	Egp	<b>12</b>	bbnSpflgp
<b>6</b>	Ggp	<b>13</b>	ospf
<b>7</b>	Hello	<b>14</b>	bgp

### **5.13 Overall Statistic Functions**

Overall statistic functions, Top (Network Statistic), Health (Network Health), Device (Device Identification), Problem (Problem Find), are placed in the 2nd-5th tab above system information area. These functions monitor real-time tester's state all the time during operation.

#### **5.13.1 Network Statistic**

Network statistic is used for classification statistic and showing received data of two ports from starting up or clearing. According to different statistical content, statistical items will be divided into 18 items, General, Length, Broadcast/Pause, L2 Protocols, L3 Protocols, L4 Protocols, Error, VLAN, Dadi, MPLS, Service interrupt, Stream1, Stream2, Stream3, Stream4, Stream5, Stream6, Stream7, Stream8, as is shown in figure 5.13.1.

Stat.Items	Port1	Port2
General:		
Tx Cur Traffic(Mbps)	100.00	0.00
Rx Cur Traffic(Mbps)	0.00	100.00
Rx Data Traffic(Mbps)	0.00	98.68
Rx Cur Utility Ratio(%)	0.00	100.00
Rx Avg Utility Ratio(%)	0.00	100.00
Rx Max Utility Ratio(%)	<0.01	100.00
Tx Cur Frame Rate(Fps)	8266	0
Rx Cur Frame Rate(Fps)	0	8267
Rx Avg Frame Rate(Fps)	0	8267
Rx Max Frame Rate(Fps)	7	8268

Figure 5.13.1 Network Statistic

**[Rx Time(s)]:** Show time of port1 and port2 receiving data from starting up or clearing.

**[Display]:** Select some item to show. The setting interface is shown as in figure 5.13.2.

Stat.Items		
General	Length	Broadcast/PAUSE
L2 Protocols	L3 Protocols	L4 Protocols
Error	VLAN	Dadl
MPLS	Stream1	Stream2
Stream3	Stream4	Stream5
Stream6	Stream7	Stream8
Service Interrupt		

Figure 5.13.2 Network Statistic Display Items

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Statistic items are as following:

**[General]:**

1. **[Tx Cur. Traffic (Mbps)]**: sending traffic in Mbps unit and 0.01Mbps precision.
2. **[Rx Cur. Traffic (Mbps)]**: receiving traffic of L1 in Mbps unit and 0.01Mbps precision.
3. **[Rx Data Traffic (Mbps)]**: receiving traffic of L2 in Mbps unit and 0.01Mbps precision.
4. **[Rx Cur. Utility Ratio (%)]**: current receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
5. **[Rx Avg. Utility Ratio (%)]**: average receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
6. **[Rx Max Utility Ratio (%)]**: Max receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
7. **[Tx Cur. Frame Rate (Fps)]**: current sending velocity.
8. **[Rx Cur. Frame Rate (Fps)]**: current receiving velocity.
9. **[Rx Avg. Frame Rate (Fps)]**: average receiving velocity.
10. **[Rx Max Frame Rate (Fps)]**: max receiving velocity.
11. **[Tx Frms.]**: total frames of sending.
12. **[Rx Frms.]**: total frames of receiving.
13. **[Tx Bytes]**: total bytes of sending.
14. **[Rx Bytes]**: total bytes of receiving.
15. **[Rx Err. Frms.]**: Error frames of receiving.

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**[Length]:**

1. **[Rx Min Len.]:** minimum frame length of receiving.
2. **[Rx Max Len.]:** maximum frame length of receiving.
3. **[Rx <64]:** receiving frames whose length less than 64.
4. **[Rx =64]:** receiving frames whose length equal to 64.
5. **[Rx 65~127]:** receiving frames whose length is between 65 and 127.
6. **[Rx 128~255]:** receiving frames whose length is between 128 and 255.
7. **[Rx 256~511]:** receiving frames whose length is between 256 and 511.
8. **[Rx 512~1023]:** receiving frames whose length is between 512 and 1023.
9. **[Rx 1024~1518]:** receiving frames whose length is between 1024 and 1518.
10. **[Rx >1518]:** receiving frames whose length is more than 1518.

**[Broadcast/Pause]:**

1. **[Rx Unicast Frms.]:** unicast frames of receiving.
2. **[Rx Multicast Frms.]:** multicast frames of receiving.
3. **[Rx Broadcast Frms.]:** broadcast frames of receiving.
4. **[Rx Pause Frms.]:** pause frames of receiving.

**[L2 Protocols]:**

1. **[Rx IPV4 Frms.]:** IPV4 frames of receiving.
2. **[Rx IPV6 Frms.]:** IPV6 frames of receiving.
3. **[Rx IPX Frms.]:** IPX frames of receiving.
4. **[Rx ARP Frms.]:** RP frames of receiving.

- 
5. **[Rx RARP Frms.]**: RARP frames of receiving.
  6. **[Rx Banyan Frms.]**: Banyan frames of receiving.
  7. **[Rx DECnet Frms.]**: DECnet frames of receiving.
  8. **[Rx SNA Frms.]**: SNA frames of receiving.
  9. **[Rx Apple Talk Frms.]**: Apple Talk frames of receiving.
  10. **[Rx LLDP Frms.]**: LDDP frames of receiving.
  11. **[Rx AARP Frms.]**: AARP frames of receiving.
  12. **[Rx STP Frms.]**: STP frames of receiving.
  13. **[Rx CDP Frms.]**: CDP frames of receiving.
  14. **[Rx PPPOE Frms.]**: PPPoE frames of receiving.

**[L3 Protocol]:**

1. **[Rx TCP Frms.]**: TCP frames of receiving.
2. **[Rx UDP Frms.]**: UDP frames of receiving.
3. **[Rx OSPF Frms.]**: OSPF frames of receiving.
4. **[Rx IGRP Frms.]**: IGRP frames of receiving.
5. **[Rx ICMP Frms.]**: ICMP frames of receiving.
6. **[Rx EIGRP Frms.]**: EIGRP frames of receiving.

**[L4 Protocol]:**

1. **[Rx HTTP Frms.]**: HTTP frames of receiving.
2. **[Rx FTP Frms.]**: FTP frames of receiving.
3. **[Rx DHCP Frms.]**: DHCP frames of receiving.

- 
4. **[Rx SMTP Frms.]**: SMTP frames of receiving.
  5. **[Rx POP3 Frms.]**: POP3 frames of receiving.
  6. **[Rx IMAP Frms.]**: IMAP frames of receiving.
  7. **[Rx DNS Frms.]**: DNS frames of receiving.
  8. **[Rx RIP Frms.]**: RIP frames of receiving.
  9. **[Rx RIPNG Frms.]**: RIPNG frames of receiving.
  10. **[Rx BGP Frms.]**: BGP frames of receiving.
  11. **[NetBIOS Rx]**: NetBIOS frames of receiving.
  12. **[Rx SNMP Frms.]**: SNMP frames of receiving.

**[Error]:**

1. **[Rx FCS Err. Frms.]**: FCS error frames of receiving.
2. **[Rx MAC Err. Rate (%)]**: MAC Layer error frames of receiving.
3. **[Rx IP Err.Frms.]**: IP error frames of receiving.
4. **[Rx IP Err. Rate]**: IP error rate of receiving.
5. **[Rx TCP Checksum Err]**: TCP error frames of receiving.
6. **[Rx UDP Checksum Err]**: UDP error frames of receiving.
7. **[Rx Trans. Err. Rate (%)]**: TCP error rate of receiving.
8. **[Collision]**: total collision frames.

**[DADI Frms.]**

1. **[TX Curr. Traffic (Mbps)]**: sending traffic in Mbps unit and 0.01Mbps precision.
2. **[RX Curr. Traffic (Mbps)]**: receiving traffic of L1 in Mbps unit and 0.01Mbps

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precision.

3. **[RX Data Traffic (Mbps)]**: sending traffic of L2 in Mbps unit and 0.01Mbps precision.
4. **[Rx Curr. Utility Ratio (%)]**: current receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
5. **[Rx Avg. Utility Ratio (%)]**: average receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
6. **[Rx Max. Utility Ratio (%)]**: max receiving Bandwidth Ratio of L2 in 0.01Mbps precision.
7. **[Tx Frames]**: total frames of sending.
8. **[Rx Frames]**: total frames of receiving.
9. **[Tx Bytes]**: total bytes of sending.
10. **[Rx Bytes]**: total bytes of receiving.
11. **[Rx Out of Seq.]**: receiving bytes of out-of-order frames .

**[VLAN]:**

1. **[Rx C-VLAN Frms.]**: C-VLAN frames of receiving.
2. **[Rx C-VLAN ID]**: C-VLAN ID of the last C-VLAN frame of receiving.
3. **[Rx C-VLAN Pri]**: C-VLAN priority of the last C-VLAN frame of receiving.
4. **[Rx S-VLAN Frms.]**: S-VLAN frames of receiving.
5. **[Rx S-VLAN ID]**: S-VLAN ID of the last S-VLAN frame of receiving.
6. **[Rx S-VLAN Pri]**: S-VLAN priority of the last S-VLAN frame of receiving.

**[MPLS]:**

- 
1. **[Rx MPLS Frms.]**: total MPLS frames of receiving.
  2. **[Rx MPLS #1 Unicast Frms.]**: MPLS#1 unicast frames of receiving.
  3. **[Rx MPLS #1 Multicast Frms.]**: MPLS#1 multicast frames of receiving.
  4. **[MPLS #1 Label]**: the Label value of the last receiving MPLS#1 frame.
  5. **[MPLS #1 Cos]**: the Cos value of the last receiving MPLS#1 frame.
  6. **[Rx MPLS #2 Unicast Frms.]**: MPLS#2 unicast frames of receiving.
  7. **[Rx MPLS #2 Multicast Frms.]**: MPLS#2 multicast frames of receiving.
  8. **[MPLS #2 Label]**: the Label value of the last receiving MPLS#2 frame.
  9. **[MPLS #2 Cos]**: the Cos value of the last receiving MPLS#2 frame.
  10. **[Rx MPLS #3 Unicast Frms.]**: MPLS#3 unicast frames of receiving.
  11. **[Rx MPLS #3 Multicast Frms.]**: MPLS#3 multicast frames of receiving.
  12. **[MPLS #3 Label]**: the Label value of the last receiving MPLS#3 frame.
  13. **[MPLS #3 Cos]**: the Cos value of the last receiving MPLS#3 frame.

**[Service interrupt]:**

- 1.**[Service interrupt time]**: It includes current value,maximum value,minmum value,average value,interruptions,Total time.unit:us.
- 2.**[No Info. Time]**: It includes current value,maximum value,minmum value. unit:us.

**[Stream\*]**: to show statistics information of Stream \*.

1. **[S\* Tx Cur. Traffic (Mbps)]**: sending Stream\* traffic in Mbps unit and 0.01Mbps precision.
2. **[S\* Rx Cur. Traffic (Mbps)]**: sending Stream\* traffic of L1 in Mbps unit and 0.01Mbps precision.
3. **[S\* Rx Data Traffic (Mbps)]**: sending Stream\* traffic of L2 in Mbps unit and

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0.01Mbps precision.

4. [**S\* Tx Frms.**]: total frames of S\* sending.
5. [**S\* Rx Frms.**]: total frames of S\* receiving.
6. [**S\* Tx Bytes**]: total bytes of S\* sending.
7. [**S\* Rx bytes**]: total bytes of S\* receiving.
8. [**S\* Rx FCS Err.Frms.**]: FCS error frames of S\* receiving.
9. [**S\* Rx IP Err.Frms.**]: IP Checksum error frames of S\* receiving.
10. [**S\* Rx TCP Checksum Err.**]: TCP Checksum error frames of S\* receiving.
11. [**S\* Loss Frms.**]: Lost frames of receiving.
12. [**S\* Frm. Loss(%)**]: Receiving lost rate to sending.
13. [**S\* Max Latency(us)**]: S\* max latency of transmission.
14. [**S\* Min Latency(us)**]: S\* min latency of transmission.
15. [**S\* Avg Latency(us)**]: S\* average latency of transmission.

### **5.13.2 BERT**

Used to count and show Bert test status as the following figure 5.13.3.

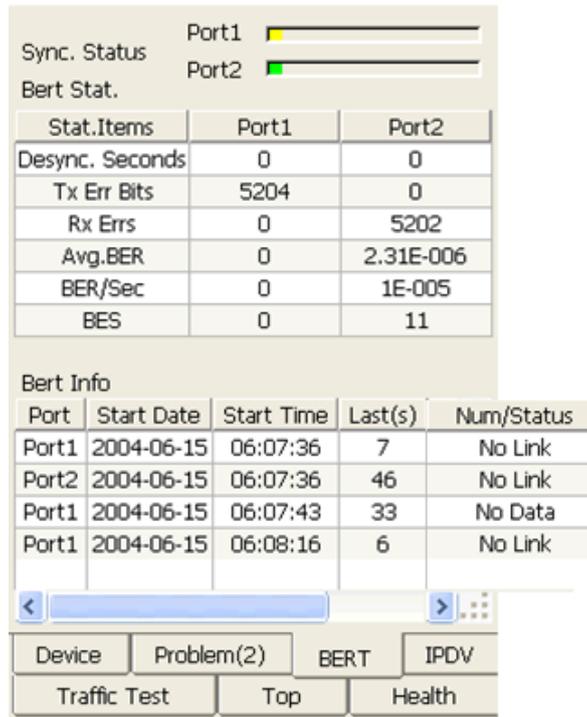


Figure 5.13.3 Bert Statistic

1. **[Synchronous Status]:** Show real-time synchronous status of port1 and port2. Color yellow means that the system does not receive data of bert test. Color red expresses that bert test is out of sync. Green expresses that test is synchronous.
2. **[Bert Statistic]:** Show statistical information of twin port receiving bert, including:
  - [Desync. Seconds]:** Total time of out-sync state.
  - [Tx Err. Bits]:** Sending bert bits.
  - [Rx Errs]:** Total bert bits of receiving.
  - [Avg. BER]:** Ratio of bert bits to receiving all the bits under synchronous status.
  - [BER/Sec]:** Ratio of bert bits to receiving all the bits in current second under synchronous status.
  - [BES]:** Seconds of receiving bert under synchronous status.

### 5.13.3 IPDV

Used to check and statistic network latency jitter of port1 and port2, as is shown in figure 5.13.4.

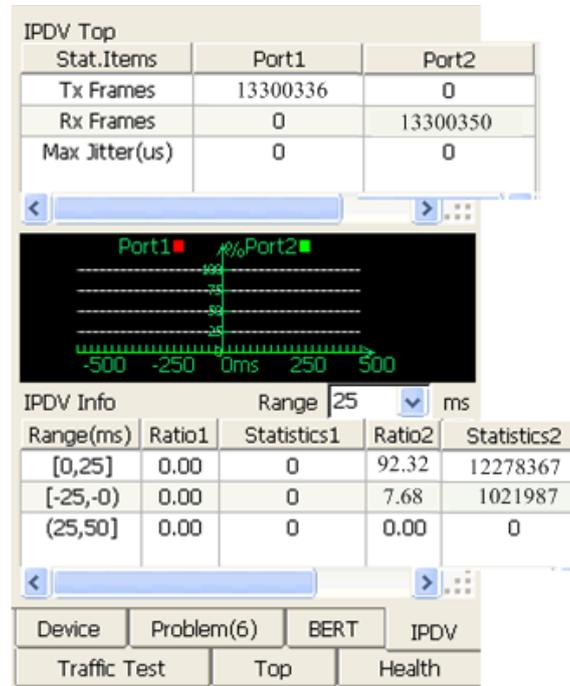


Figure 5.13.4 IPDV Statistic

1. **[Rang]:** Specify range for showing. The range includes 1,2,3,10,25.
2. **[Tx Frames]:** Count of sending frames for port1 and port2 IPDV statistic.
3. **[Rx Frames]:** Count of receiving frames for port1 and port2 IPDV statistic.
4. **[Max Jitter (us)]:** Maximum latency jitter of port1 and port2.
5. **[Min Jitter (us)]:** Minimum latency jitter of port1 and port2.
6. **[Avg. Jitter (us)]:** Average latency jitter of port1 and port2.

### 5.13.4 Network Health

Used to receive network statistic data to check the status of network running, the stability of network and possible problems. Main interface is shown in figure 5.13.5.

Frms. Stat.	Port1	Port2
Unicast	0	1449867
Multicast	0	0
Broadcast	0	9
Error	0	2
FCS Err	0	2
MAC Err Rate	0	1.38E-006
Jumbo	0	0
Runt	0	0
Collision	0	0
Collision Rate	0	0
IP Checksum Err	0	0
IP Err Rate	0	0

<

> ...

Traffic Test	Top	Health
Device	Problem(4)	BERT IPDV

Figure 5.13.5 Network Health

Statistic items are as following:

1. **[Unicast]:** Unicast frames of receiving.
2. **[Multicast]:** Multicast frames of receiving.
3. **[Broadcast]:** Broadcast frames of receiving.
4. **[Error]:** Error frames of receiving.
5. **[FCS Err]:** FCS error of receiving.
6. **[MAC Err Rate]:** Ratio from error frames in MAC layer to total frames of receiving.
7. **[Jumbo]:** Long frames of receiving.
8. **[Runt]:** Short frames of receiving.
9. **[Collision]:** Conflict frames of receiving.
10. **[Collision Rate]:** Ratio from Conflict frames to total frames.

- 
11. **[IP Checksum Err.]:** IP checksum error frames of receiving.
  12. **[IP Err. Rate]:** Ratio from IP checksum error frames to total frames.
  13. **[TCP Checksum Err.]:** TCP checksum error frames of receiving.
  14. **[UDP Checksum Err.]:** UDP checksum error frames of receiving.
  15. **[Trans. Err. Rate]:** Ratio from TCP error frames to total frames.

### 5.13.5 Device

Device identification identifies devices in the network through monitoring all kinds of message sent by network devices, as is shown in figure 5.13.6.

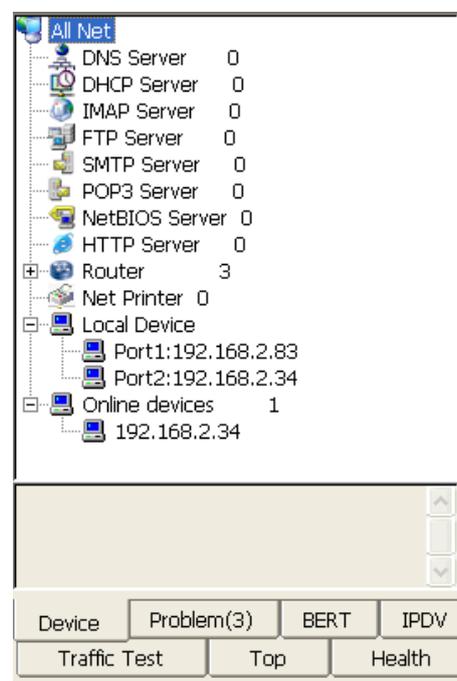


Figure 5.13.6 Device Identification

1. **[Result]:** Show discovered devices and its' type. Device types that can be analyzed include DNS server, DHCP server, IMAP server, FTP server, SMTP server, NETBIOS server, router, network printer, and other devices (for example, computer and so on).

2. **[Details]:** Show detail information of selected device, including IP address, MAC address and setting information.

### 5.13.6 Problem

This page is used to report network problems found from starting up or clearing about physical connection, traffic, application layer and so on, as is shown in figure 5.13.7.

No.	Problem ID	Problem Type	IP	Time
1	40001	Traffic		2004-06-15 06:09:51
2	40001	Traffic		2004-06-15 06:14:53
3	40001	Traffic		2004-06-15 06:17:27

Figure 5.13.7 Problem Found

1. **Result List:** Show problems checked in the network. Information of problem is as following:

[Problem ID]: Breakdown ID that protocol defines of found problems.

[Problem Type]: Type of found problems.

[IP]: IP address of network device with the problem.

[Time]: Time of finding problem.

2. **[Details]:** Show detail description of selected problem below.



When Cooperation or Y.1564 Test starts, [Bert], [IPDV], [Device] and [Problem] will be unusable.

---

## 5.14 Auto Test

### 5.14.1 Auto Test

Auto test function is used to start performance tests up automatically by script file. At present, 8130A tester supports auto test about Traffic Test and RFC2544 Test.

#### 5.14.1.1 Test Operation

Click “Auto Test” menu item to enter into interface of auto test, as is shown in figure 5.14.1.

The steps are as following:

**Step 1:** Write script file with specified commands on PC.

**Step 2:** Import script file to auto test directory through Data Manage module.

**Step 3:** Configure test parameters through parameters setting modules.

**Step 4:** Import parameter files to auto test directory through Data Manage module.

**Step 5:** Start auto test, and load script file.

**Step 6:** Execute automatic performance test.



Figure 5.14.1 Auto Test Starting Interface

The instruction of controls is as following:

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**[Load]:** Load script file.

**[Run]:** Execute script to do performance test automatically. The auto test progress interface is shown in figure 5.14.2.

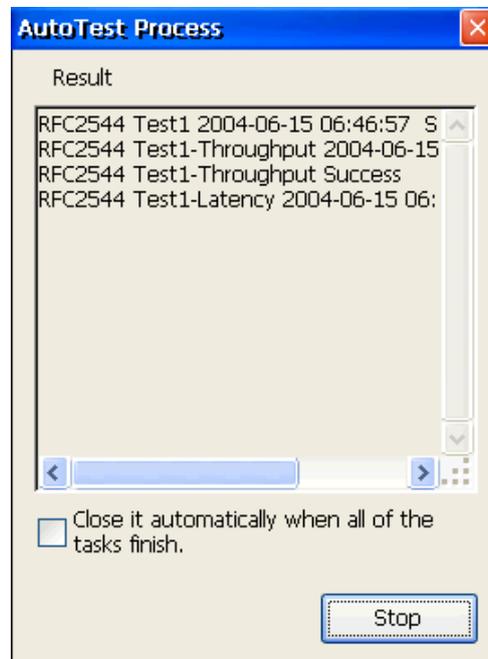


Figure 5.14.2 Auto Test – Test Progress Interface.

This interface shows status of auto test running. Click [Stop] to stop current test.

If [Close it automatically when all of the tasks finish] is selected, the window will not close until all of tasks have finished. Otherwise, the box will close by clicking [Close].

When all of tasks have finished, the system creates corresponding test report automatically.

### 5.14.1.2 Script Command

Script of auto test is written with specified commands. Script calls **AutoTestStartup.exe** to execute specified operations.

The commands are as following:

**-ttype :** Task type. 0 represents RFC2544 Test, 1 is Traffic Test.

**-st :** Starting time. The format of time is year/month/day/hour/minute/second.

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**-tt:** Test duration. The format is day/hour/minute/second. This command is used in only traffic test.

**-pf:** Name of parameter files (characters of name don't include space).

**-ppf:** Name of port parameter files.

**-ot :** Name of test report.

**-streamindex:** Index of stream. Range is 0~9, and 0 represents single stream.

**( ):** Starting and ending of some stream parameters.

**-threanable:** Enable or disable throughout test. 0 or nothing represents that current RFC2544 test don't include throughout test. 1 represents that throughout test enables.

**-lossenable:** Enable or disable frame loss test. 0 or nothing represents that current RFC2544 test don't include frame loss test. 1 represents that frame loss test enables.

**-b2benable:** Enable or disable back to back test. 0 or nothing represents that current RFC2544 test don't include back to back test. 1 represents that back to back test enables.

**-latencyenable:** Enable or disable latency test. 0 or nothing represents that current RFC2544 test don't include latency test. 1 represents that latency test enables.



Character number of each row command in script must be less than 256. Otherwise, auto test will not run normally.

### **5.14.2 Auto Recovery**

Auto recovery is used in the case of performance test closing abnormally. If auto recovery function starts (see 5.16.1), when tester closes abnormally, auto recovery will work after restarting the tester, as is shown in figure 5.14.3. User can check undone tasks and restore these tasks.

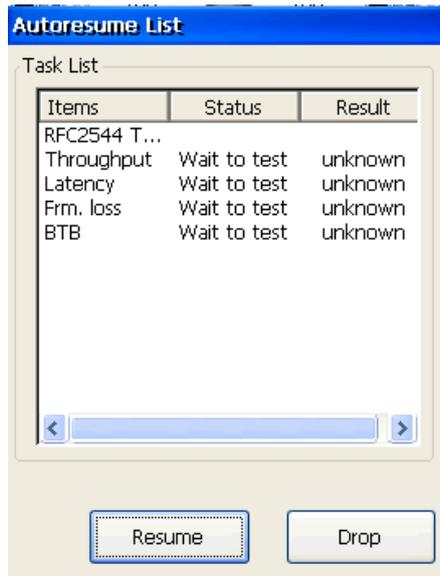


Figure 5.14.3 Auto Recovery

## 5.15 Data Manage

Data management is used for manage creating test reports, parameters files, and operation of the files.

### 5.15.1 File Save

#### 5.15.1.1 Normal Report Save

Click  in each page, the box for saving reports, as is shown in figure 5.15.1, will pop-up to save data of current page. But this function can't be used in Wire&Port module, test cooperation module, Download Speed and Packet capture module.

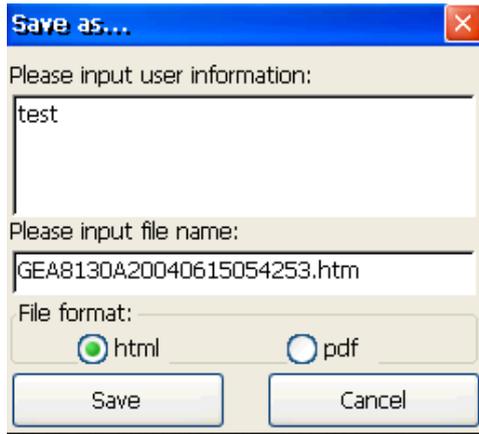


Figure 5.15.1 File Save

1. **[Please input user information]:** Input user information of report.
2. **[Please input file name]:** Set report name. Default name consists of test type and test time.
3. **[File format]:** Set file format of report. 8130A tester supports two file formats, HTML and PDF.
4. **[Save]:** Save the file.
5. **[Cancel]:** Cancel the operation of saving.

### 5.15.1.2 Realtime Report Save

This function is only used for saving data in “ Top ” page under through mode. The function realizes that traffic data is saved real time.

In “ Top ” page under through mode, click  icon, the mode interface will pop up, as is shown in figure 5.15.2.

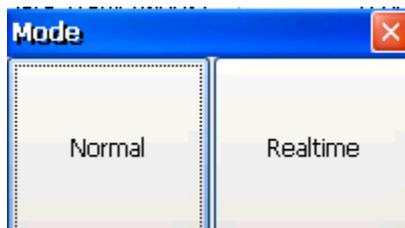


Figure Mode

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[Normal]: Pop up saving interface of normal report, refer to chapter 5.15.1.1.

[Realtime]: Pop up saving interface of realtime report, as is shown in figure 5.15.3.

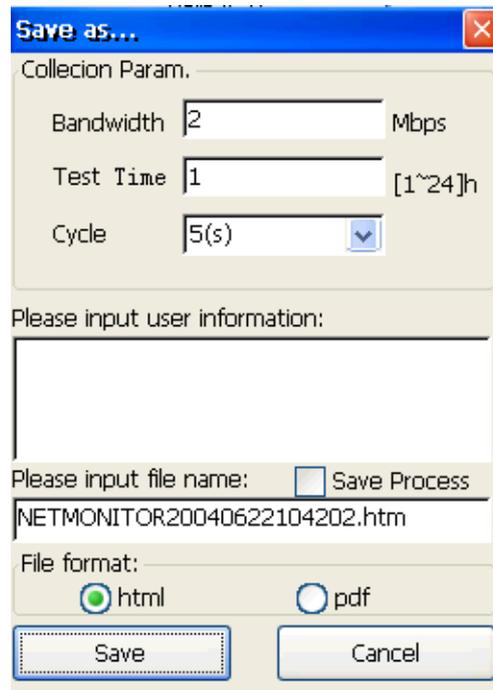


Figure 5.15.3 Realtime Saving Parameters

1. **Bandwidth:** range is 1-1000 Mbps.
2. **Test Time (h) :** range is 1~24h.
3. **Cycle:** include 1, 5, 10, 30, 60, 300, 600, 1800 seconds.
4. **Save Processn:** select whether process information is saved.

When clicking “Save” button, the system will save traffic data according to parameters. And the system saves final report that is similar with normal report as soon as it is the time.

The  or  icons will show after parameters are set.  icon expresses that realtime report has being saved, and  expresses that realtime report has finished saving. You can click the icons to check saving parameters, including start time, saving duration, sampling cycle, current state, left time and **[Stop/Test]** button, as is shown in figure 5.15.4.

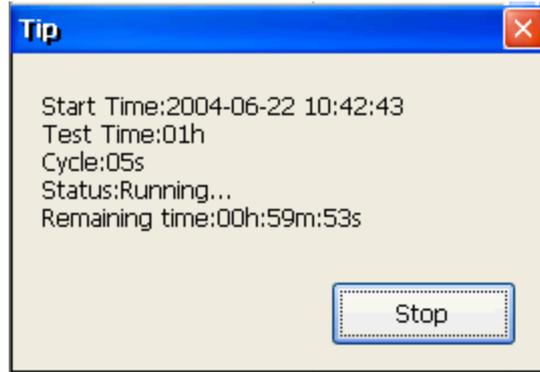


Figure 5.15.4 Realtime Report Saving Information

[Stop/Start]: Stop or Start realtime report saving.

: When saving finishes,  will hide after the information tip box closes.

### 5.15.2 File Manage

Used for operating the saved test results such as viewing, managing, exporting, configuration file exporting and importing etc, as is shown in figure 5.15.5.

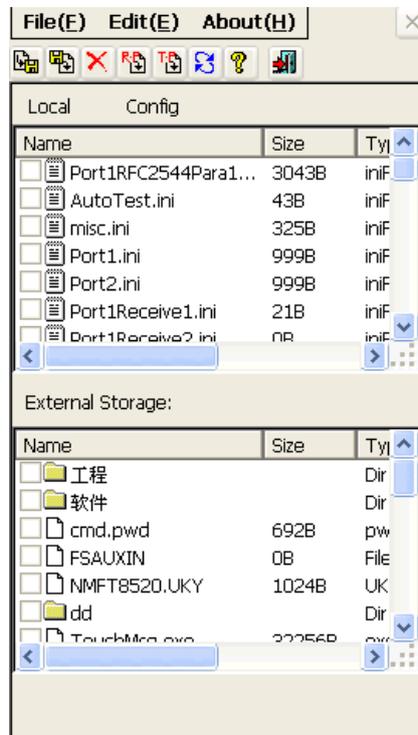


Figure 5.15.5 Data Manage

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1. **[File]:** Click to select the test files, configuration files or exit data manage, as is shown in figure 5.15.6.

- 1) **[Test File]:** Show the saved results, including traffic test, NetMonitor, Ping test, RFC2544 performance test, Trace-route, Net-Scan, NetHealth, Problem Prober, Main, SNMP, Server Test, BERT, IPDV, Y.1564 Test.
- 2) **[Config.]:** Select the configuration data, the system configuration parameters can be displayed in the local storage list.
- 3) **[AutoTest]:** Show all the files and folders in autotest folders.
- 4) **[Exit]:** Click to quit the data manage.

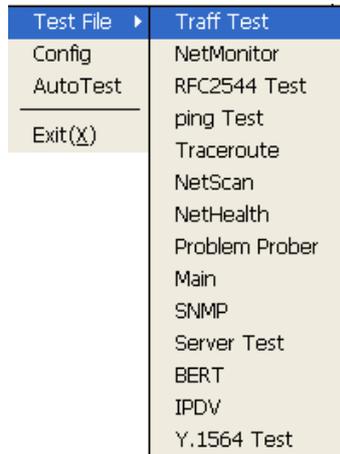


Figure 5.15.6 File Menu

2. **[Edit]:** Click to operate the saved data, including import, export, export RFC1544 para., export Traffic para., delete, delete all and refresh. The figure is as following:



Figure 5.15.7 Edit Menu

- 
3. [**About**]: Show the data manage version information.

Tool bars:

1. [Import - 2. [Export - 3. [Delete - 4. [Export RFC2544Para. - 5. [Export TrafficPara. - 6. [Refresh - 7. [Help - 8. [Exit 

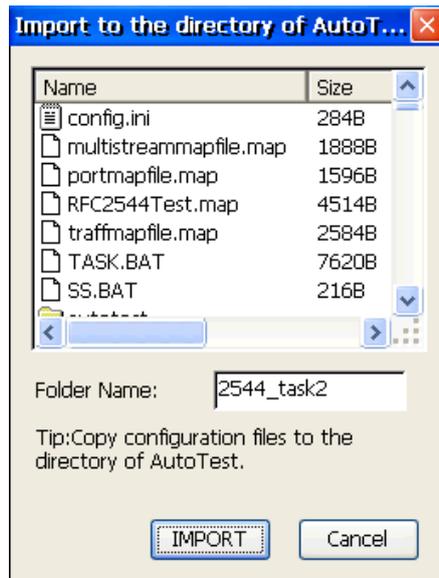


Figure 5.15.8 The box of import to autotest folder



Before copy the file, please ensure whether the U disk has been inserted and identified correctly (“” is shown on the top of tester).

## 5.16 System Manage

### 5.16.1 System Set

Used for setting system’s relevant parameters, as is shown in figure 5.16.1.

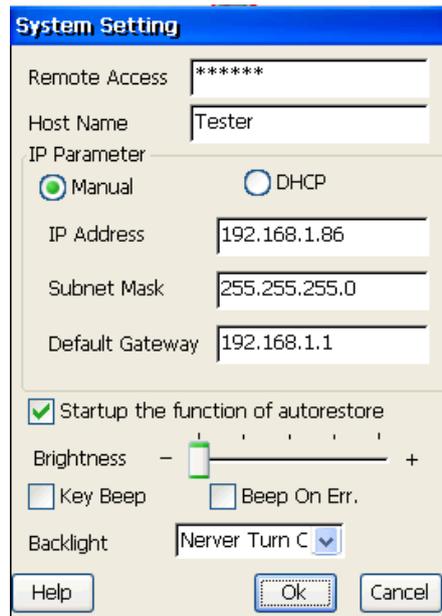


Figure 5.16.1 System Setting

1. **[Remote Access]:** to set password for remote control login. When remote control is selected, the password is availed.
2. **[Hostname]:** to set the device name.
3. **[IP Parameter]:** Set the configuration mode of system network parameters, manual or DHCP; the modification would be forbidden in Remote Control status.
  - 1) **[IP Address]:** It is effective for manual, setting IP address of the port, such as 192.168.1.1; the text box is grey for DHCP and IP address is obtained automatically; the modification would be forbidden in Remote Control status.
  - 2) **[Subnet Mask]:** It is effective for manual, setting IP address' subnet mask; the text box is grey for DHCP and Subnet Mask is obtained automatically; the modification would be forbidden in Remote Control status.
  - 3) **[Default Gateway]:** It is effective for manual, setting network's default gateway address; The text box is grey for DHCP and Gateway address is obtained automatically; the modification would be forbidden in Remote Control status.

- 
4. **[Auto Restore]:** to enable or disable auto restore function.
  5. **[Brightness]:** User can adjust the screen brightness by dragging Bright/Dark scroll according to the test environment.
  6. **[Key Beep]:** to enable or disable beep on key.
  7. **[Beep On Err.]:** to enable or disable beep on error.
  8. **[Backlight]:** In order to save the electric power, the backlight can be turned off when the user does not operate the system for a period of time. The OFF time of the background light can be selected within the range from 15 seconds to 30 seconds or be set as “Never”. The background light will be OFF automatically if the user does not operate the system within the selected time period. The background light will be ON automatically if the user click the screen or any key (excluding Power keys).

### **5.16.2 MAC Address**

Modify the MAC address of system network card and test network card. The 8130A tester can provide a test network card, a system network card. The interface location, please reference Chapter “Appearance and Interfaces”. So it provide both the modify options above in user’s interface.

The modify steps are as follows:

1. Click [System Manager] menu item. Select [MAC Address]. MAC address setting box will pop up, as is shown in figure 5.16.2.

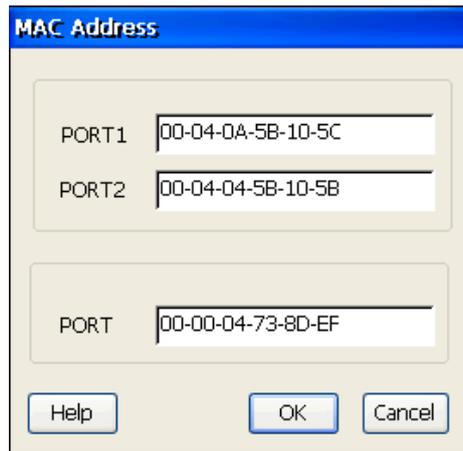


Figure 5.16.2 MAC Address

2. Click MAC address text box which you want to modify, the system will pop-up soft keyboard, fill in and click OK, the system will give you the tips: “MAC has been changed, change is effective after reboot device immediately, sure to reboot?”. Choose “YES”, the device will be reboot, meanwhile the MAC address you set will be effective. Choose “NO”, the system will abandon what you modified and use the primary MAC address.

### 5.16.3 Screen Adjust

The tester adapts touch-screen to operate, so the calibration of the screen is needed before using.

The steps are as following:

1. Click [**System Manage**], select [Screen Adjust], enter into it, as shown in figure 5.16.3.

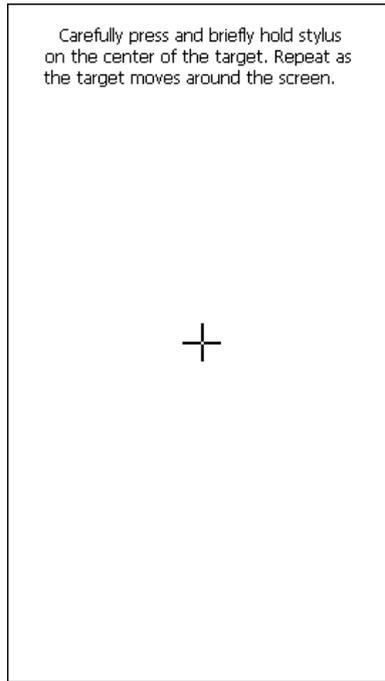


Figure 5.16.3 Screen Adjust

2. Use stylus to click slightly the central point of cross cursor on the screen until the cursor moves.
3. The cursor will move in order from the screen's central point to the top left corner, lower left corner, lower right corner and top right corner. At every location, you need to repeat 3<sup>rd</sup> step operation for calibration.
4. After finishing the calibration, click [▶/■] key to exit.



The click should be perpendicular to the touch screen and click the central point of the cross cursor. The calibration will be repeated if the calibration is not successful.

#### **5.16.4 Factory Set**

Resume the factory set. The system will give the tips “Sure to restore factory settings?”. Choose “YES”, the system will resume the factory set, otherwise, remain the primacy settings. If default parameters take effect, you must restart the system manually.

---

## 5.16.5 System Upgrade

The system supports manual or automatic upgrade from USB disk or storage card currently, as shown in figure 5.16.4.

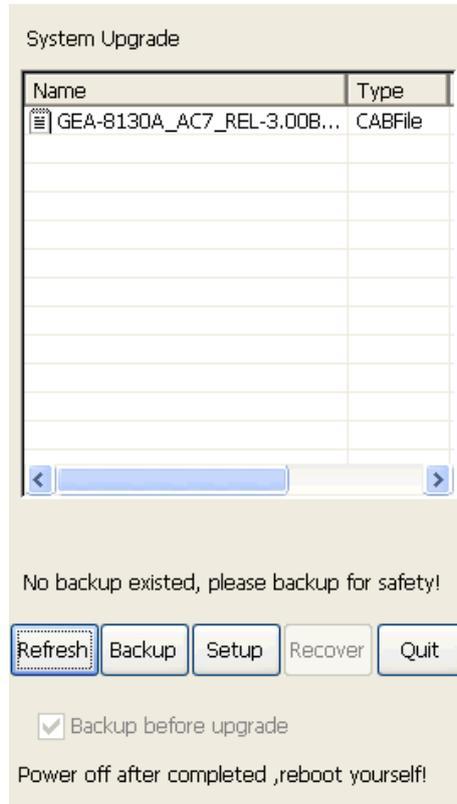


Figure 5.16.4 System Upgrade

The steps are as following (1~5 steps suitable for manual upgrade):

1. Copy the upgrade packages (.cab) into the USB-disk.
2. Insert the USB disk into the USB port on the right side of the tester.
3. Enter into “Upgrade” from main interface, and main program will be closed; system will scan all the upgrade packages in the USB disk. User should manually select a package in the list.
4. Click [**Setup**], and the system will automatically retrieve selected software upgrade package. In upgrading, progress will be shown, and if upgrade succeeds, message like “**Upgrade Completed**” will be shown, otherwise error message like “**Upgrade Failed**” will be shown.

- 
5. System will restart main program if upgrade succeeds; suggest restart the system manually after upgrade is finished, to ensure the upgraded version work normally.
  6. Click [**Backup**], the system will backup current version automatically, and if user want to resume pre-version, please click [**Recover**].
  7. **Auto upgrade:** if there are upgrade packages of newer versions, system can discover them and show the prompt “**Found Newest Version, Upgrade? \*.cab**”. If users want to upgrade, click “Yes” otherwise “No”. If “Yes”, system will then close main program and upgrade automatically.
  8. **Auto recovery:** if some accidents such as power-off occurred in the process of setup, backup or recover, system can recover automatically itself according to the situation, which includes:
    - 1) If “**Stop**” is pressed by user in upgrading, system will start up “**roll back**” automatically.
    - 2) If power is shut down in upgrading, when in next boot, system will check if there is any newer version of upgrade packages in the storage card. If newer version is found, it will prompt to users. System will automatically upgrade with the newest version if users agree, otherwise resume the system back to pre-version if users disagree.
    - 3) If power is shut down in upgrading, and when in next boot if no upgrade version is found in the storage card, system will resume the system back to pre-version.
    - 4) If power is shut down in backing up, backup again is compulsory in next boot.
    - 5) If power is shut down in recovery, when in next boot, the solving method is identical to 2), 3) for finding newer version of upgrade packages or not respectively, and the system will upgrade or recover automatically according to the situation.



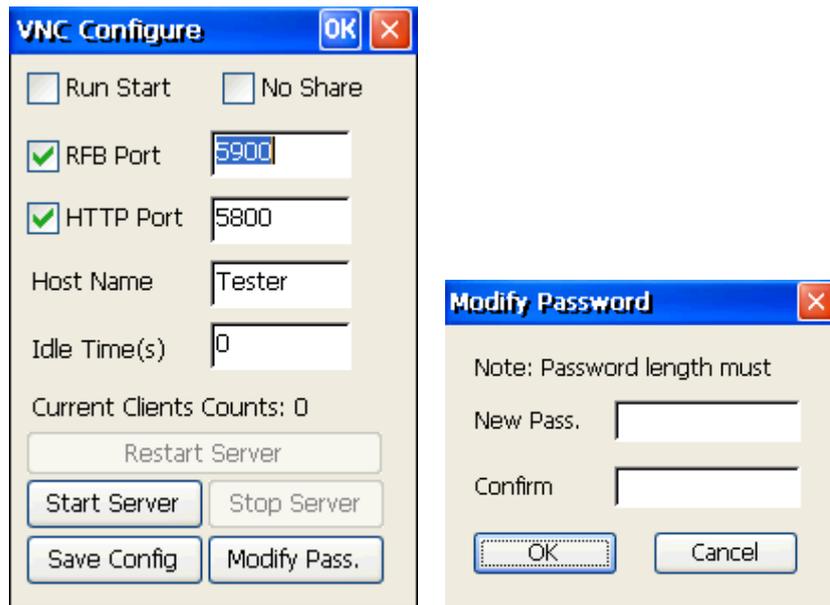
1. Packages must be placed in the root directory of the disk. In the process of upgrading, please keep USB disk always in connection status.

- 
2. If there is no backup version, especially in the first setup situation, message like “**No backup version, suggest backup**” will be shown, and [**Recover**] is disabled in this situation.
  3. Main program will be closed before upgrading, and it will be start up again after; suggest no testing when upgrading, and restart the system yourself to ensure the upgrade take effect.
  4. Users can not quit the program in backup or recovery, please wait a moment patiently.
  5. If the upgrade packages in the USB disk are changed when program running, click [**Refresh**] and you can see refreshed packages list.
  6. For automatic upgrade in running, system can search upgrade packages both in USB disk and storage card. For automatic upgrade in boot, currently only support detecting in storage card. If more than 1 newer package is found, system will choose the newest.

#### **5.16.6 Remote Control**

Tester provides Remote Control functions. User can control the tester’s interface by a user terminal connected to the same network, when turn on the remote control function of the tester and connected tester to the network through the system network port. Remote Control Setting interface as shown in figure 5.16.5, user can turn on and turn off the remote control function and set remote control parameters in this interface by clicking menu item [Remote Control]. The IP address, MAC address and other network parameters of remote control can be set in the System Setting (5.16.1) module.

User can connect 8130A tester through remote connection software on PC.



Parameters

Password

Figure 5.16.5 Remote Control Parameters setting

1. **[Run Start]**: When this option is selected, the remote control function will be started while the tester turned on.
2. **[No Share]**: When this option is selected, the user terminal can't connect to the tester when the other user terminal is already connected to the tester.
3. **[RBF Port]/[HTTP Port]** : RBF Port is used to set and limit the port of user terminal, HTTP Port is used to set and limit the HTTP Port of user terminal. HTTP Port can be set when the RBF Port is selected.
4. **[Host Name]**: Set the host name of the remote control.
5. **[Idle Time]**: Set the idle time. The remote control module will automatically disconnected when the user terminal idle timeout. When set idle time is 0, not limit the idle time. The units of idle time set is second(s).
6. **Current Client Counts**: Display the number of user terminals connected to the remote control module of tester.

- 
7. **[Start Server]**: Start the remote control functions and the user terminal can connect to the tester by entering right password.
  8. **[Stop Server]**: Stop the remote control function.
  9. **[Save Config]**: Save the remote control parameter settings.
  10. **[Modify Pass.]**: Set the remote control password by call the [Modify Password] interface.  
The password can be modify when the **[confirm]** is entered as same as **[New Pass.]**.



1. In order to ensure normal operation of the remote control, Screen Adjust, Factory Set, Ping, PPPoE and SNMP will be block.
2. If modify the system parameters, remote control will automatically restart.
3. The initial password of Remote Control is "111111".
4. When use DHCP to require system card IP address , the remote control module must be restarted manually.

### 5.16.7 Auth Manage

Used to connect storage device to import and export corresponding authorized file. Through import authorized file, user can operate test module of authorized file, the authorized situation of test module can be viewed by “**About**”page, as is shown in figure 5.16.6.



Figure 5.16.6 Authorization Management

- 
1. **[Export File]:** Export the authorized file to USB disk from the device.
  2. **[Import File]:** Import the authorized file to the device from U disk.

## 5.17 About

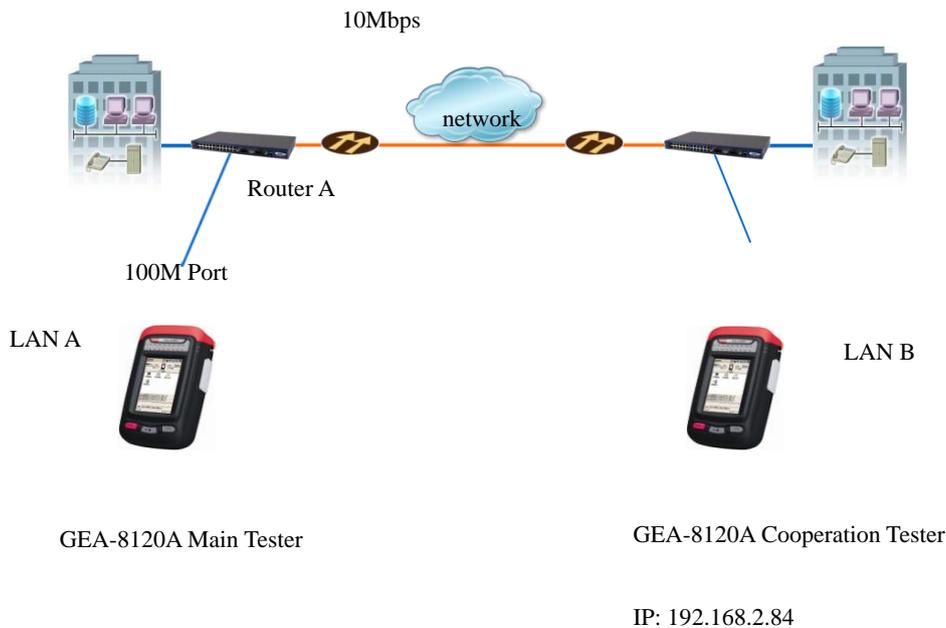
Click **[About]**, users can check the product version, system version, software version, product serial number, hardware serial number and the authorization of the software and hardware configuration.

# Chapter 6 Test Example

## 6.1 RFC2544 Test Example

### 6.1.1 Test Scenario

**Target:** to verify whether the Ethernet provided by Network Providers meets the standard requirement of bandwidth and performance they promised. Following, we will simulate a network with bandwidth of 10M between two offices of the same company. And then show how to verify the network performance and bandwidth.



---

Figure 6.1.1 RFC2544 Test Scenario

We can check the network performance by performing a RFC2544 test. As shown in above picture, two GEA-8130A testers are used: Main Tester and Cooperation Tester. When working as a Cooperation Tester, GEA-8130A supports Loopback and Cooperation modes.

When the Cooperation Tester is set to Loopback mode:

1. Main Tester sends the test packets to Cooperation Tester via the network;
2. Cooperation Tester loopbacks the test packets to Main Tester;
3. Main Tester processes the test data and generates the test report.

In the example, Main Tester run “RFC2544” test, and the Cooperation Tester is set to Loopback mode.

### **6.1.2 Test Preparations**

1. Connect the testers to network, click [Port Para. Set] to set the parameters of the local and remote end according to the network configuration. Set the Main Tester’s test port IP address to 192.168.2.83, Gateway set to 192.168.2.2. Set the Cooperation Tester’s test port IP address to 192.168.2.84, Gateway set to 192.168.2.2.
2. Run Ping test with default setting in Main Tester, and the target is Cooperation Tester. If there is no packet loss, then go ahead. Otherwise, please check the network connection and try.
3. Please refer to 6.1.3 ~ 6.1.7 for the whole test procedure.

### 6.1.3 Main Tester Parameter Setting

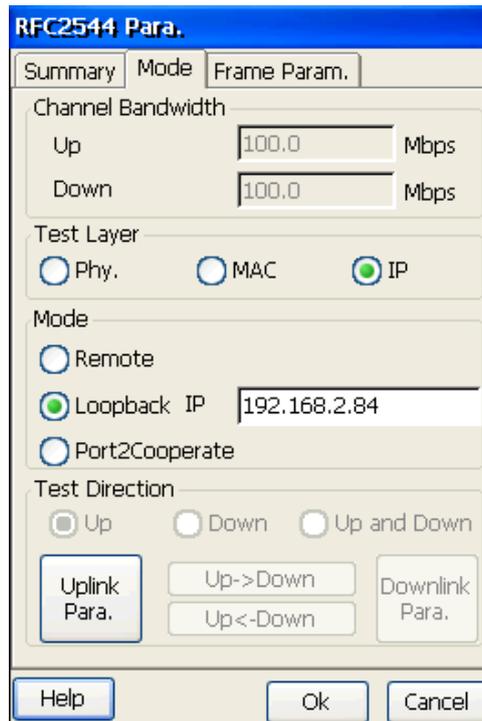


Figure 6.1.2 Main Tester Parameter Setting

**Step1:** Power on the tester and configure the port, click “RFC2544 Para. Set” menu item to enter RFC2544 parameter setting box, as is shown as in figure 6.1.2.

**Step2:** Switch to “Mode” tab and set the “Test Layer” and “Test Mode”.

1. Select “IP” in test layer.
2. Select “Loopback” in test mode. Input IP address: 192.168.2.84. Test direction will switch to “Up” automatically.
3. Click “Uplink Para.” button to enter the Up parameter setting dialog.

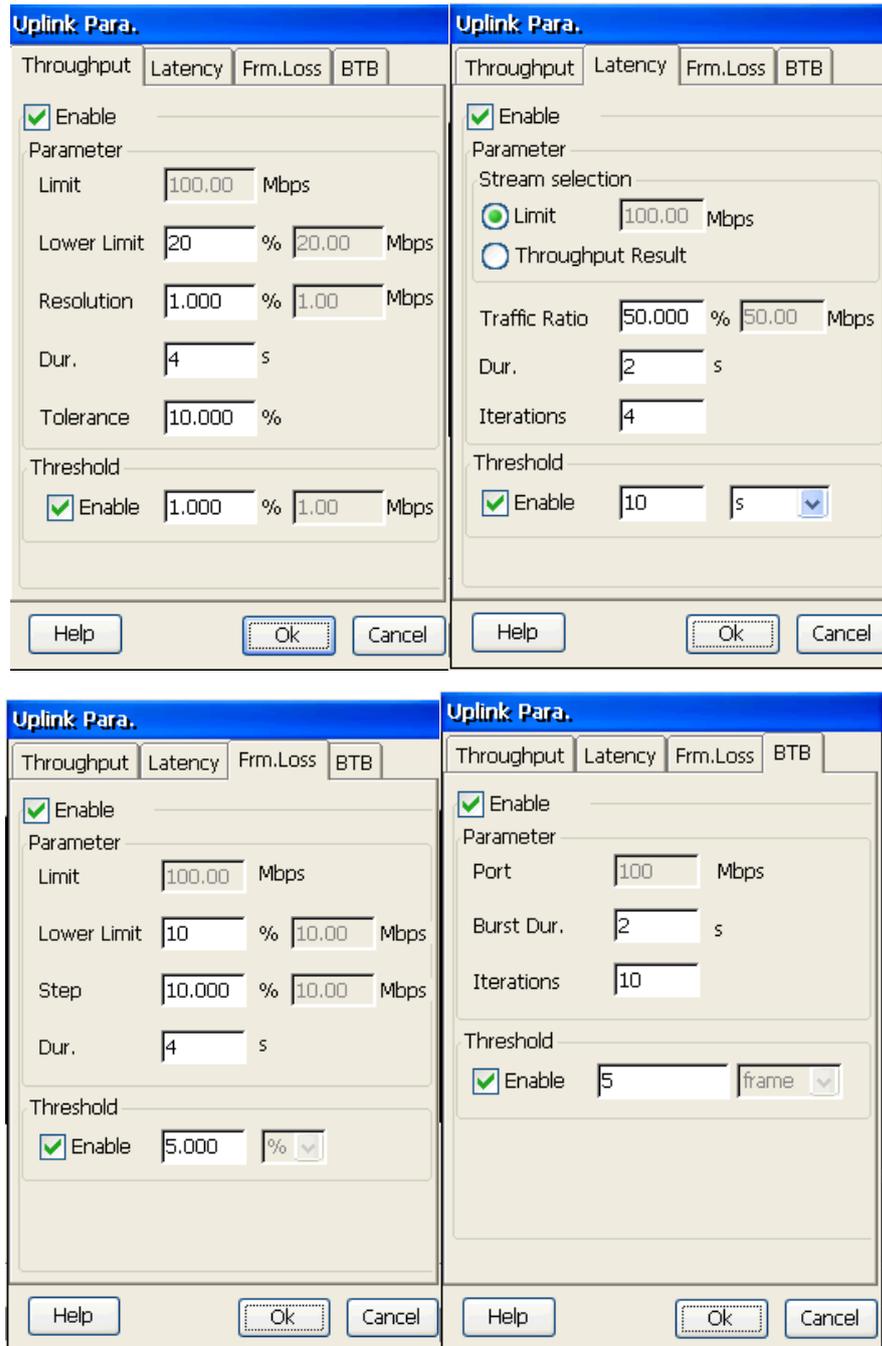


Figure 6.1.3 Uplink Parameters Setting

**Step3:** Set RFC 2544 test parameters, as is shown in figure 6.1.3. And VLAN and MPLS parameters must be set in port parameters setting box.

1. Set Throughput parameters

- 
- 1) Set "Lower Limit" to "20%"
  - 2) Set "Resolution" to "1%",
  - 3) Set "Duration" to "4s",
  - 4) Set "Tolerance" to 10%,
  - 5) Set "Threshold" to 1%.

## 2. Latency parameters

- 1) Set "Stream Selection" to "Limit",
- 2) Set "Traffic Ratio" to "50%"
- 3) Set "Duration" to "2s",
- 4) Set "Iterations" to 4,
- 5) Set "Threshold" to "10s".

## 3. Frame Loss Rate parameters

- 1) Set "Lower Limit" to "10%"
- 2) Set "Step" to 10%,
- 3) Set "Duration" to "4s",
- 4) Set "Threshold" to "5%".

## 4. Back to Back Parameters

- 1) Set "Burst" to "2s",
- 2) Set "Iterations" to 10,
- 3) Set "Threshold" to 5.

## 5. VLAN

- 
- 1) Set “S-VLAN TPID” to “0x9200”
  - 2) Set “C-VLAN” to enable
  - 3) Set “C-VLAN ID” to “570”
  - 4) Set “C-VLAN PRI” to “7”

## 6. MPLS

- 1) Set “ MPLS #1 ” to enable
- 2) Set “ MPLS #1 Label ” to “8”
- 3) Set “ MPLS #1 CoS ” to “7”
- 4) Set “ MPLS #1 TTL ” to “128”

Click “OK” to return to RFC2544 Parameters Setting box.

**Step4:** Switch to “Frame Parameters” page, as is shown in figure 6.1.4.

1. Select “DIX” in “Frame Type”,
2. Select all for the “Frame Length”.

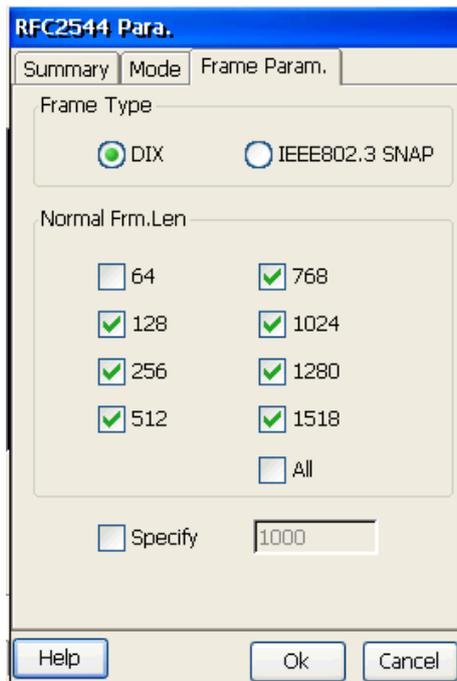


Figure 6.1.4 Frame Parameters Setting

#### 6.1.4 Cooperation Tester Parameter Setting

**Step1:** Click the “Network Performance” – “Loopback” icon and enter “Loopback” module, as shown in the following picture.

**Step2:** Set the Loopback layer to “IP”.

**Step3:** Click “Start” to start looping back the packets.



Figure 6.1.5 Loopback

### 6.1.5 Start and Stop the Test

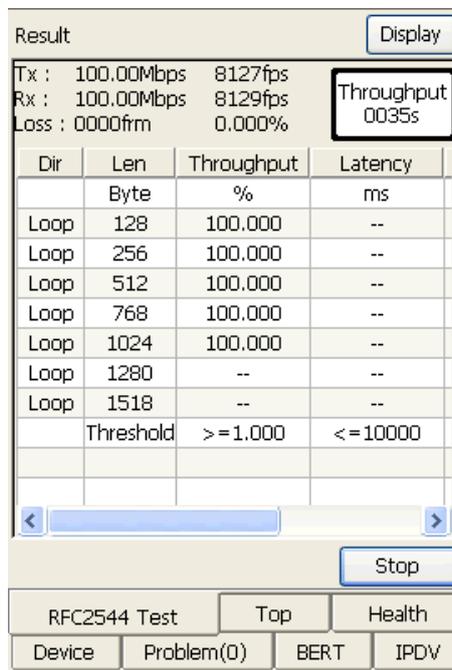


Figure 6.1.6 RFC2544 Test

**Step1:** In Main Tester, click “RFC2544 Test” icon under “Network Performance”.

---

**Step2:** Click “Start” button to start the test.

**Step3:** The button will change to “Stop” if test starts, the testing process and the overview will be shown in the GUI, as shown in figure 6.1.6. You can stop it at any time.

### **6.1.6 Check the Test Results**

As shown in figure 6.1.6, when the RFC2544 is running, the test procedure and the test data will be displayed in the GUI. Switch the tabs to check the different test items.

**Step1:** Choose “**Test Progress**” to check the process information.

**Step2:** Choose “**Result Overview**” to check the results, in which the overview can be reviewed.

**Step3:** Choose the each page of “**Throughput**”, “**Latency**”, “**Loss-Rate**” and “**BTB**” to check the test result about each item.

**Step4:** Notice will be shown after the test is finished, and the “Save” button will be enabled. Click it to save the test results for later check and print.

### **6.1.7 Export Test Results**

**Step1:** Insert a USB disk.

Note: Please confirm the USB disk can be recognized before copy the report, “” can be shown once recognized.

**Step2:** Click the “**Data Manage**” icon to enter the Data Export module, as shown in figure 6.1.7.

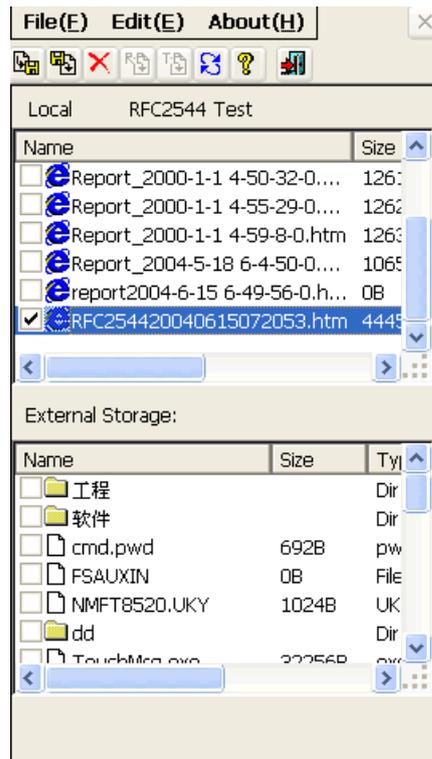


Figure 6.1.7 Data Export

**Step3:** Click “File” – “Test File” – “RFC2544 Test”. In the local list, RFC2544 reports will be reviewed. Select the files you want to export after entering into the interface. Click “” icon to transfer the selected file to USB disk.

**Step4:** Click “” icon to quit.

## 6.2 Traffic Test Example

### 6.2.1 Test Scenario

Network traffic anomaly is the main performance for network communication failure; meanwhile, it also will be network transmission fault aura. So tracking the changes of the network traffic timely can discover and avoid the network potential failure, as well as locate and troubleshooting it immediately. Additionally, error arise inevitably during data transmission process, such as caused by outside interferences or quality of internal system transmission is not good. Bit Error Rate is the most commonly used to measure the quality index of data communication transmission

system.

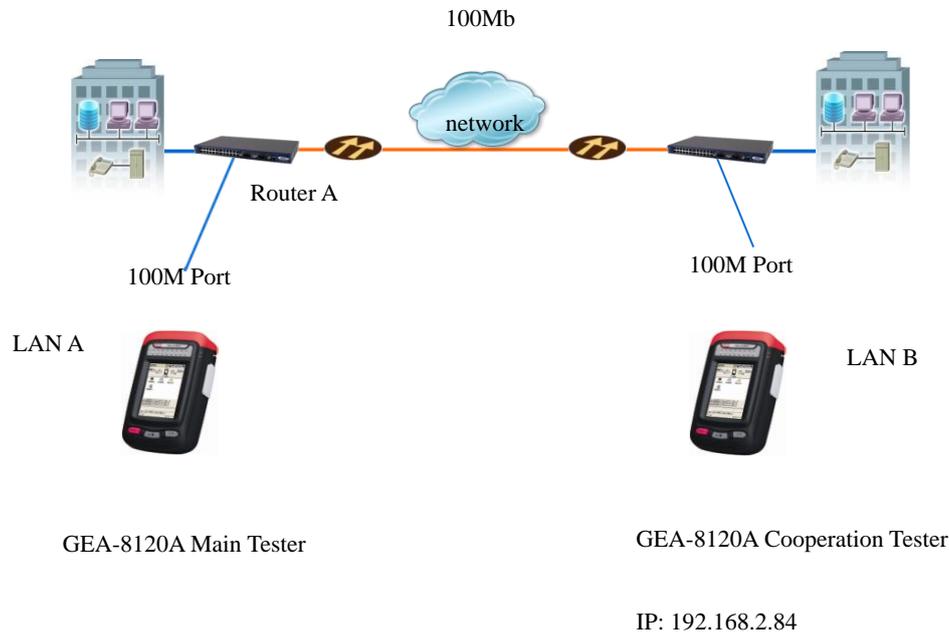


Figure 6.2.1 Traffic Test Scenario

Traffic test scenario is shown in figure 6.2.1. Two testers are used to perform the test, they send packets to each other in the same time with a variety of traffic load, protocol and frame types and length, in constant, burst or ramp modes, to completely simulate actually network.

In this case, supposed there is a new open but not yet in service 100M bandwidth network. The testers will simulate single stream, and manual error insertion is performed.

## 6.2.2 Test Preparations

1. Connect the testers to the network, and click [**Port Para. Set**] to set the parameters of the local and remote end according to the network configuration. Set the Main Tester's test port IP address to 192.168.2.83, gateway set to 192.168.2.2. Set the Cooperation Tester's test port IP address to 192.168.2.84, gateway set to 192.168.2.2.
2. Run Ping test with default setting in Main Tester, and the target is Cooperation Tester. If there is no packet loss, then go ahead. Otherwise, please check the network connection and

try.

3. Please refer to 6.2.3 ~ 6.2.7 for the whole test procedure. Both Main Tester and Cooperation Tester must be configured.

### 6.2.3 Set Traffic Generation Parameters

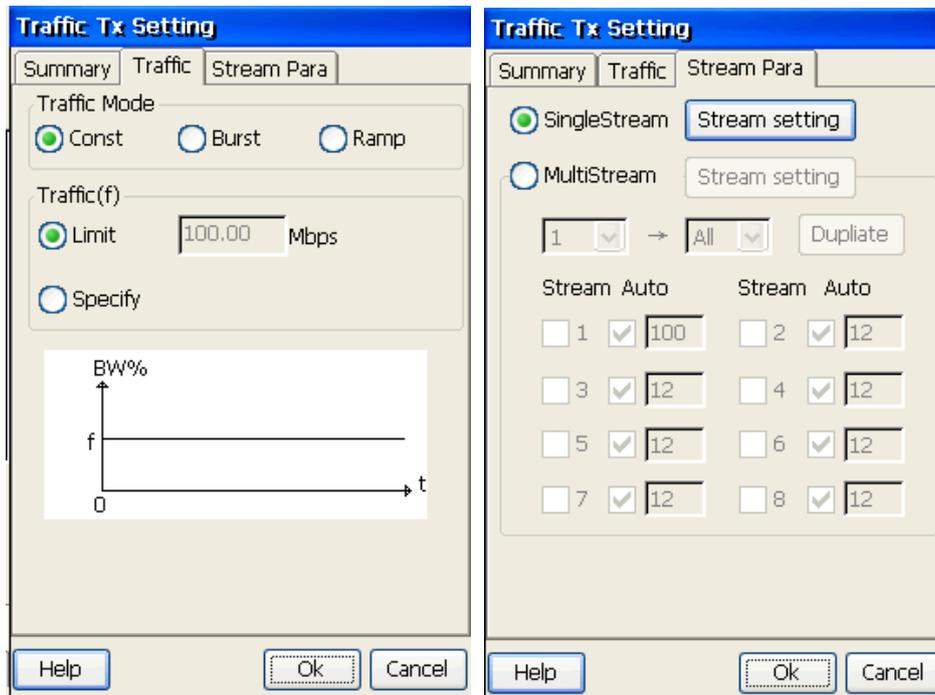


Figure 6.2.2 Traffic Sending Parameters Setting

**Step1:** Click “**Traffic Tx Para. Set**” to enter send parameters setting, as is shown in figure 6.2.2.

**Step2:** Click “**Traffic**” page to set traffic parameters. Select “**Constant**” traffic mode and “**Limit**” traffic.

**Step3:** Switch to “**Stream Para.**” tab, select “**Single Stream**”, and click “**Stream setting**” to enter single traffic setting.

**Step4:** Set Test Layer parameters, as is shown in figure 6.2.3.

1. Click “**Frame**” tab, select IP layer.
2. Set “**Frame type**” to “**DIX**”.

3. Frame length setup includes Specify and random, set to Specify 80.
4. Set BERT Pattern to  $2^7-1$ .

Note: In single stream mode, VLAN and MPLS parameters are parameters in port parameters setting. And in multiple stream mode, VLAN and MPLS parameters are user-defined.

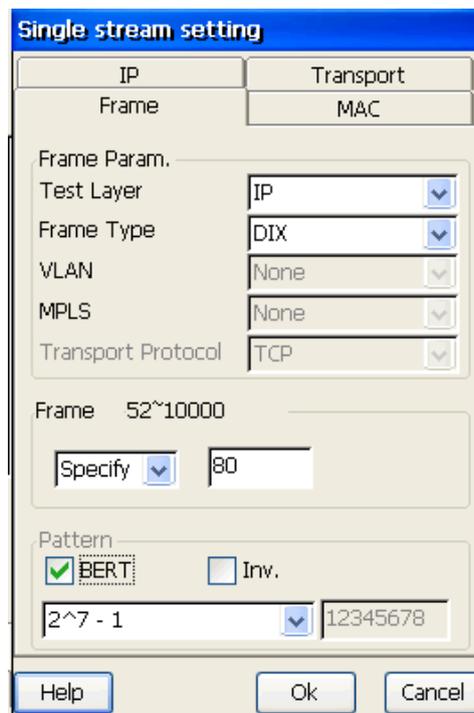


Figure 6.2.3 Test Layer Parameters Setting

**Step5:** Set IP Layer parameters

1. IP Layer is selected in Step5, so switch to IP Layer tab to set IP parameters. As shown in figure 6.2.4.

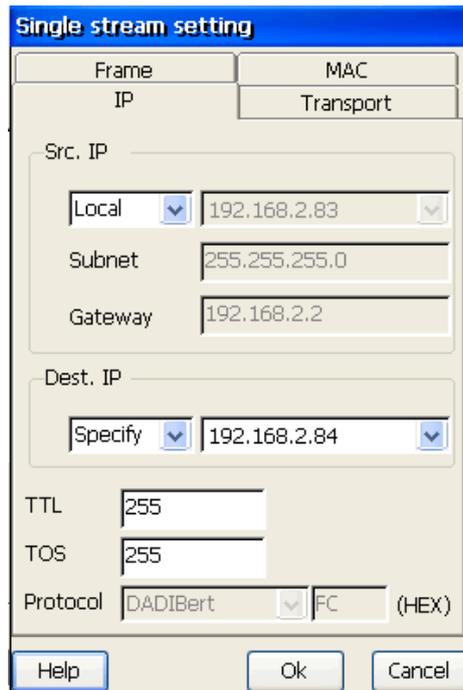


Figure 6.2.4 IP Layer Parameters Setting

2. Set source IP address to local address.
3. Set destination IP address to 192.168.2.84.
4. Click “**Ok**” to save the Traffic Generation parameter setting.

#### **6.2.4 Setup BERT Parameters (options)**

If wanting to perform the BERT, set the parameters in “Network Performance” → “Traffic Test” → “Insert Setting”, as is shown in figure 6.2.5.

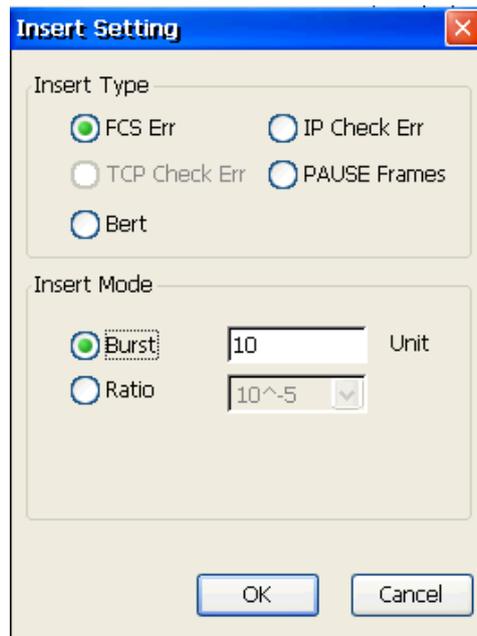


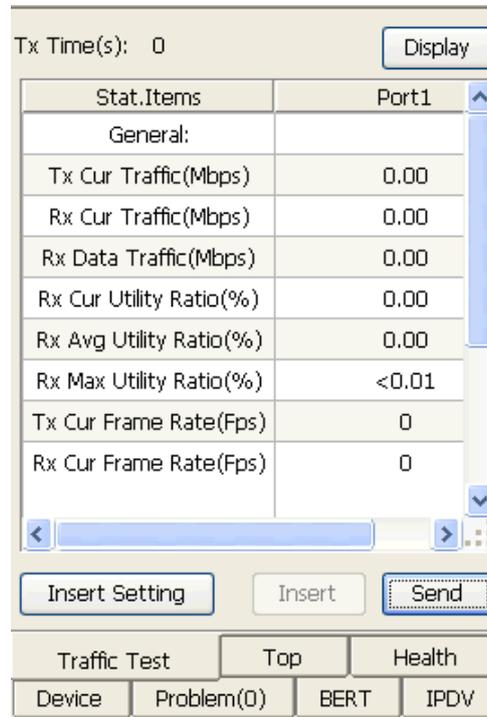
Figure 6.2.5 BERT Parameters Setting

**Step1:** In main interface, click “Network Performance”→ “Traffic Test” to enter into traffic test interface.

**Step2:** Click “Insert Setting” to enter into “BERT Insert Setting”.

**Step3:** Select error type and insert mode.

## 6.2.5 Start and Stop the Test



The screenshot shows a software interface for a traffic test. At the top left, it displays "Tx Time(s): 0" and a "Display" button. Below this is a table with two columns: "Stat.Items" and "Port1". The table contains the following data:

Stat.Items	Port1
General:	
Tx Cur Traffic(Mbps)	0.00
Rx Cur Traffic(Mbps)	0.00
Rx Data Traffic(Mbps)	0.00
Rx Cur Utility Ratio(%)	0.00
Rx Avg Utility Ratio(%)	0.00
Rx Max Utility Ratio(%)	<0.01
Tx Cur Frame Rate(Fps)	0
Rx Cur Frame Rate(Fps)	0

Below the table are three buttons: "Insert Setting", "Insert", and "Send". At the bottom of the interface, there are several tabs: "Traffic Test", "Top", and "Health". Under "Traffic Test", there are sub-tabs for "Device", "Problem(0)", "BERT", and "IPDV".

Figure 6.2.6 Start Traffic Test

**Step1:** In main interface, click “Network Performance”→ “Traffic Test” to enter into traffic test interface, as is shown in above figure.

**Step2:** Click “Start” to send traffic packets, as is shown in figure 6.2.7.

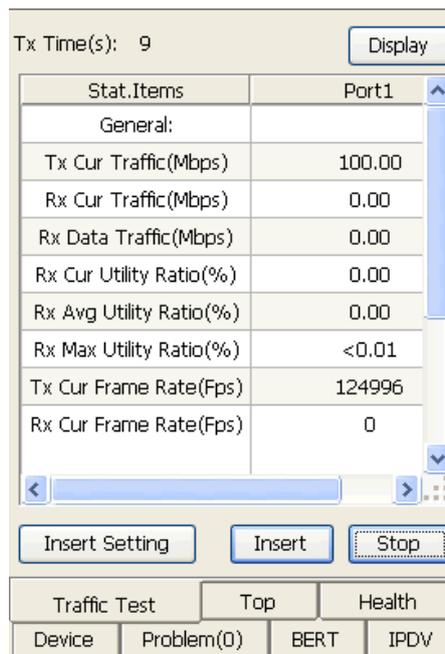


Figure 6.2.7 Traffic Test

**Step3:** The “**Insert**” button will be enabled, if pressing it 10 FCS Error frames will be sent out. If insert mode is Ratio, FCS error frame will not be sent out until the “**Insert Stop**” button is pressed. And it will be checked and displayed in the Cooperation Tester.

**Step4:** According to test duration request, click “**Save**” to save current traffic measurement results in the test period.

**Step5:** Click “**Stop**” button to stop the Traffic Test.

## 6.2.6 Export Test Results and Print

For details please refer to 6.1.7 “**Export Test Results**”.

## 6.3 Y.1564 Test Example

### 6.3.1 Test Scenario

Y.1564 Test is similar with RFC2544 Test about function. But Y.1564 test evaluates performance of network more efficiently and roundly.

Test scenario refers to RFC2544 test’s (see 6.1.1). 8130A tester supplies 4 test modes of Y.1564

---

test: Remote, Loopback, Port2 Cooperate and Port2 Loop.

Environmental simulation is following:

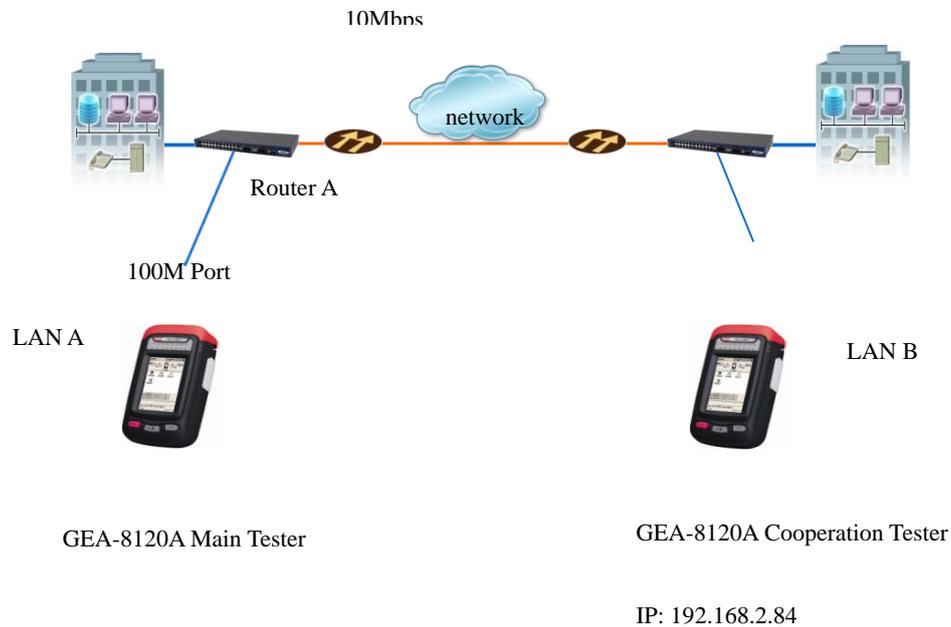


Figure 6.3.1 Y.1564 Test Scenario

We can check performance and KPI of network through Y.1564 test under the above environmental simulation. This example will adopt cooperation mode. Main tester sends up traffic and statistics down traffic data, and cooperation tester sends down traffic and statistics up traffic data.

Progress of Y.1564 test is following:

1. UP Test

- 1) Main Tester sends the test packets to Cooperation Tester via the network;
- 2) Cooperation Tester receives data and statistics loss ratio, frame delay variation and latency;
- 3) Cooperation Tester sends statistical data to main tester. Main Tester shows the test data.

2. Down Test

- 
- 1) Cooperation Tester sends the test packets to Cooperation Tester via the network;
  - 2) Main Tester receives data and statistics loss ratio, frame delay variation and latency;
  - 3) Main Tester shows the test results.

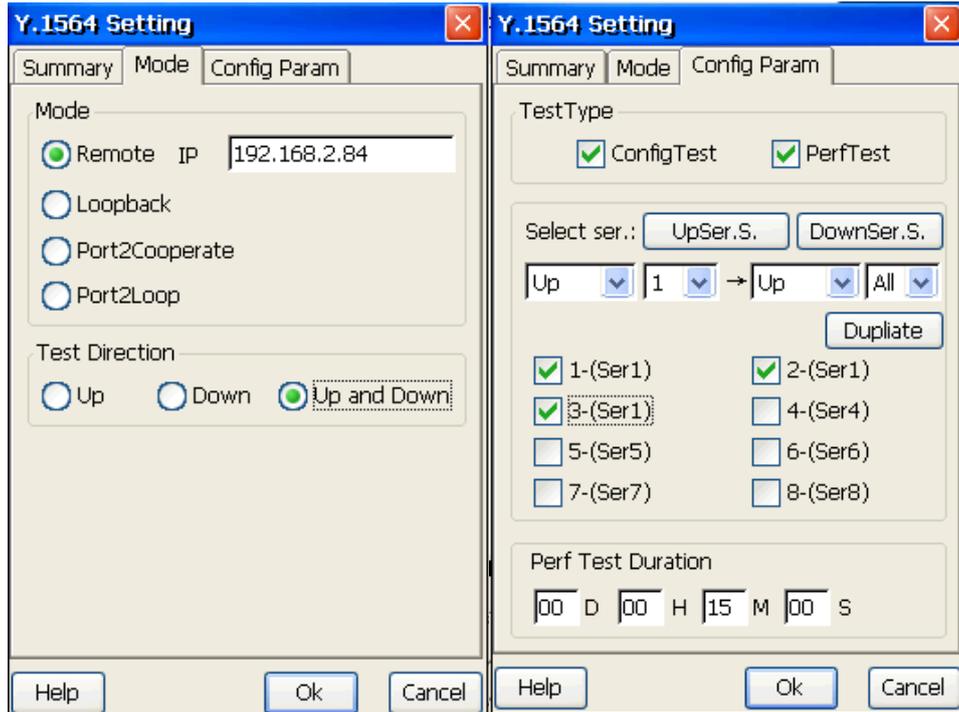
### **6.3.2 Test Preparations**

1. Connect the testers to network, click [Port Para. Set] to set the parameters of the local and remote end according to the network configuration. Set the Main Tester's test port IP address to 192.168.2.83, Gateway set to 192.168.2.2. Set the Cooperation Tester's test port IP address to 192.168.2.84, Gateway set to 192.168.2.2.
2. Run Ping test with default setting in Main Tester, and the target is Cooperation Tester. If there is no packet loss, then go ahead. Otherwise, please check the network connection and try.
3. Please refer to 6.3.3 ~ 6.3.7 for the whole test procedure.

### **6.3.3 Main Tester Parameter Setting**

**Step 1:** Click "Y.1564 Para. Set" menu item to enter into Y.1564 Setting interface.

**Step 2:** Switch to "Mode" tab page to set test mode and test direction, as is shown in the following left picture.



Y.1564 Mode

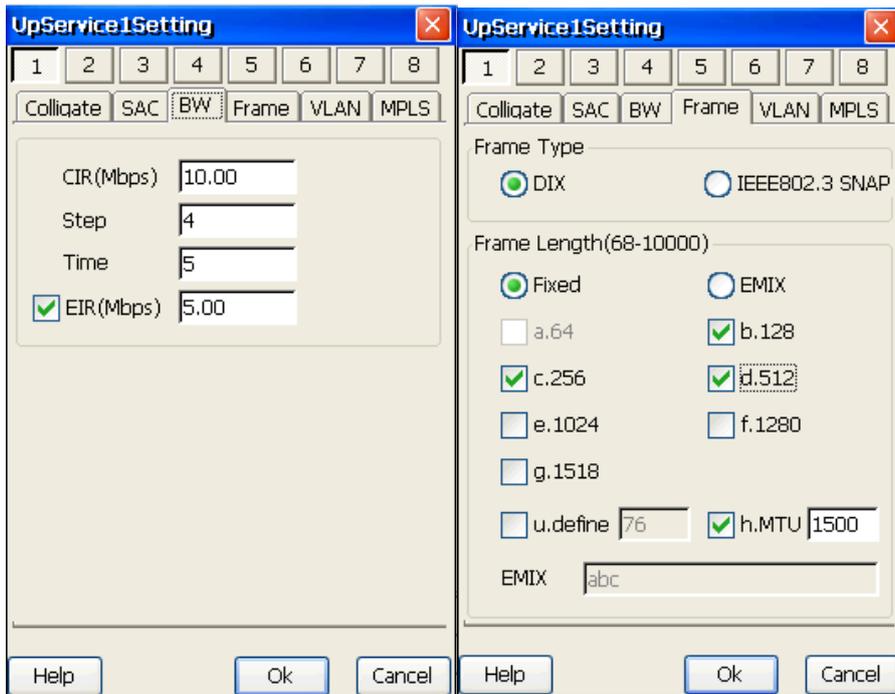
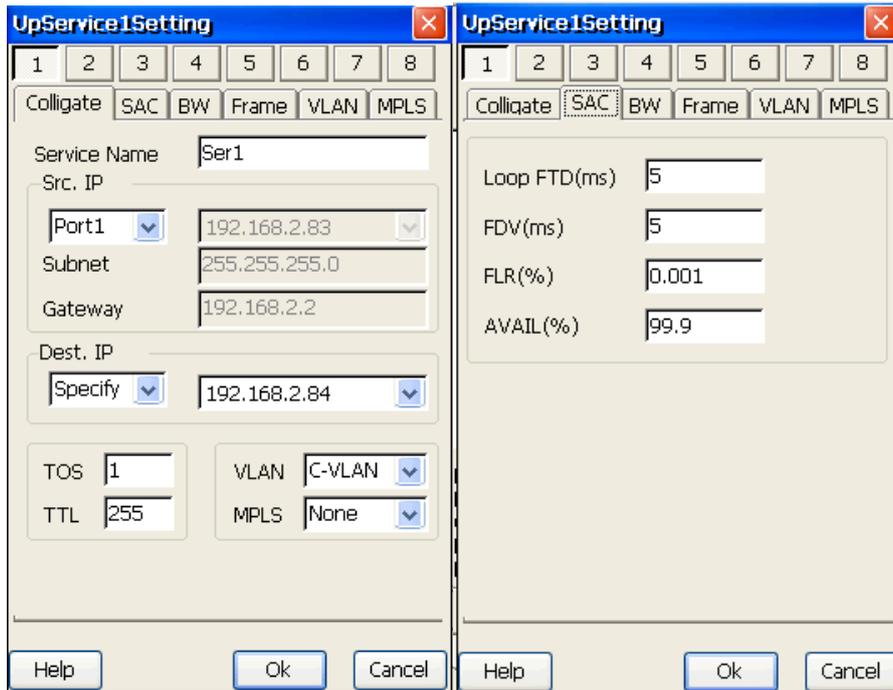
Y.1564 Configure parameters

Figure 6.3.2 Y.1564 Setting

1. Select “Remote” and input remote IP address 192.168.2.84.
2. Set “test direction” to “UP and Down”.

**Step 3:** Switch to “Config. Param” page, as is shown in right figure of figure 6.3.2.

1. Set “Test Type” to “ConfigTest” and “PerfTest”.
2. Click “UpSer. S.” button to set up service parameters. And Click “DownSer. S.” to set down service parameters. Figure 6.3.3 shows the up service parameters setting (down service parameters setting is similar with up).



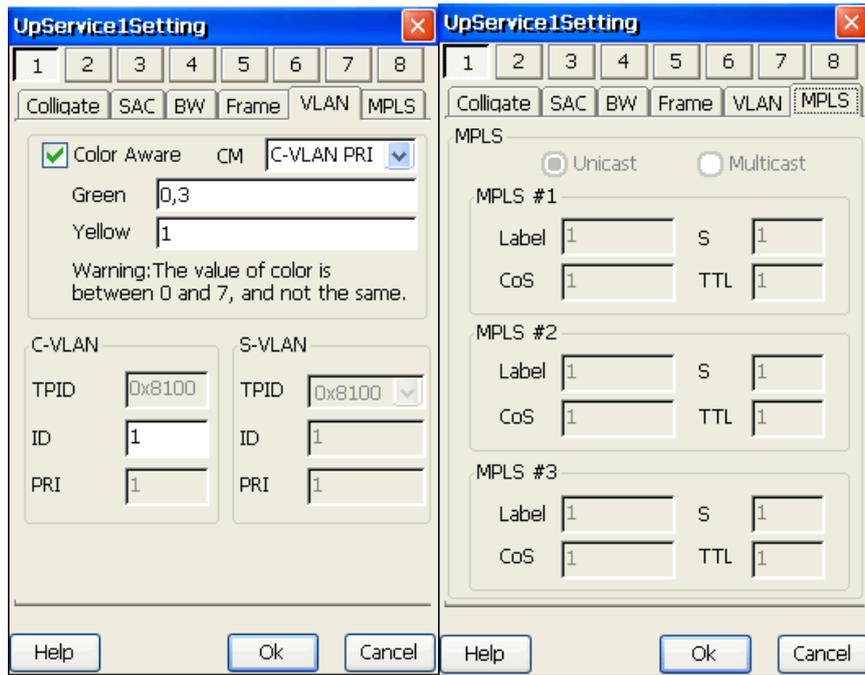


Figure 6.3.3 Up Service Setting

Parameters are following:

Up service parameters:

1) Colligate

Service Name: Ser1

Src. IP: Port1 192.168.2.83; Dest. IP: 192.168.2.84

TOS: 1; TTL: 255; VLAN: C-VLAN; MPLS: None

2) SAC

Loop FTD(ms): 5 FDV(ms): 5

FLR(%): 0.001 AVAIL(%): 99.9

3) BW

CIR(Mbps): 10.00 Step: 4

Time: 5            EIR(Mbps): 5.00

4) Frame

Frame Type: DIX      Frame Length: Fixed 128,256, 512

5) VLAN

Color Aware: Enable    CM: C-VLAN PRI

Green: 0, 3            Yellow: 1

C-VLAN: TPID 0x8100 ID 1

3. Select service ID to duplicate (option). This method is used in the case of some service settings. Copy up service1 setting to up other settings and all of the down service settings, as is shown in figure 6.3.4.

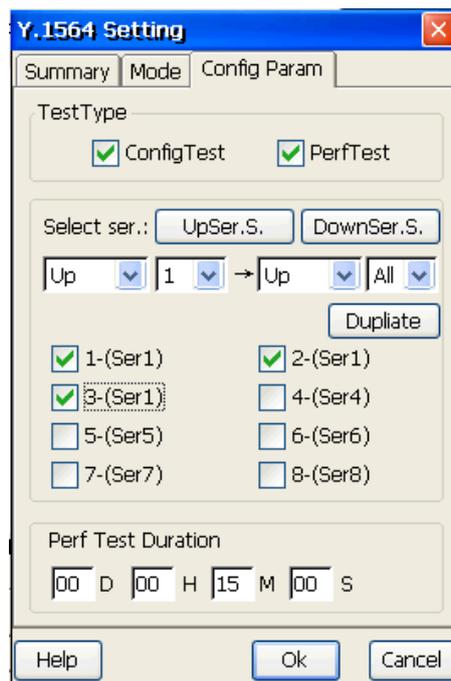


Figure 6.3.4 Parameters Duplicate

Process of duplicating is following: Select Up serevice1 and up all, click “Duplicate” to copy the parameters. And then copy parameters to all of the down service setting.

---

Modify source IP 192.168.2.84 and destination. IP 192.168.2.83 of down service parameters.

4. Select service ID : 1, 2, 3 to test.
5. Set “performance test duration” to “15M”.

### 6.3.4 Cooperation Tester Parameters Setting

Use auto cooperation function to make cooperation tester enter into cooperation mode automatically.

**Step 1:** Click “Network Performace” → “Cooperation” to select cooperation mode, Remote Cooperation, as is shown in figure 6.3.5.

**Step 2:** Select “Manual Connect”, and input remote IP 192.168.2.84.

**Step 3:** Click “Connect” button to connect remote tester. When tip box, “Remote sets successfully. ”, pop up and cooperation icon shows in the system area, you can do Y.1564 test.

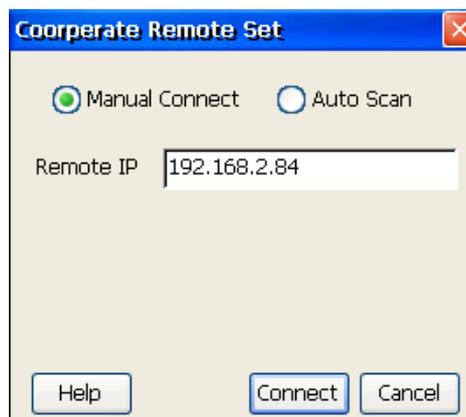


Figure 6.3.5 Auto Cooperation

### 6.3.5 Start and Stop the Test

**Step 1:** Click “Network Performace” → “Y.1564” to do Y.1564 test, as is shown in figure 6.3.6.

**Step 2:** Click “Start” to start Y.1564 test.

**Step 3:** The button will change to “Stop” if test starts, the testing process and the overview will be

shown in the GUI, as shown in figure 6.3.6. You can stop it at any time.

ID	Frame Tx IR	Bytes	Mbps	FTD	ms	FDV	ms	FLR	%
CIR:									
1:128			2.50	<1		<1		0.000	
1:128			5.00	<1		<1		0.000	
1:128			7.50	<1		<1		0.000	
1:128			10.00	<1		<1		0.000	
EIR:									
1:128			10.00	<1		<1		0.000	
1:128			5.00	<1		<1		0.000	
EIR+:									
1:128			10.00	<1		<1		0.000	
1:128			6.25	<1		<1		0.000	
CIR:									
1:256			2.50	<1		<1		0.000	
1:256			5.00	<1		<1		0.000	
1:256			7.50	<1		<1		0.000	

Figure 6.3.6 Y.1564 Test

### 6.3.6 Check the Test Results

As shown in figure 6.3.6, when the Y.1564 is running, the test procedure and the test data will be displayed in the GUI. Switch the tabs to check the different test items.

**Step 1:** Choose “**Result Overview**” to check the results, in which the overview can be reviewed.

**Step 2:** Choose “**Configuration**” to check the configuration result of each service.

**Step 3:** Choose “**Performance**” to check the performance test result of each service.

**Step 4:** Notice will be shown after the test is finished, and the “Save” button will be enabled.

Click it to save the test results for later check and print.

### 6.3.7 Export Test Results

For details please refer to 6.1.7 “**Export Test Results**”.

---

## 6.4 Auto Test Example

### 6.4.1 Test Scenario

Some users call for special test environment such as time, field and so on. For example, tests for service performance must run in idle network. So user may need to test at night or at other times. Auto test function can help users to realize this task automatically as long as user set test parameters and test environment. At that time users can attend to this matter.

### 6.4.2 Test Preparations

The example in this chapter refers to RFC2544 autotest. Click “RFC2544 Para. Set” menu item to set RFC2544 parameters (see 6.1.3). And then save it. Open “Data Manage”, and select “Config.”. Click “Export RFC2544para” menu item or button to set task name to “2544\_task”, and click “IMPORT” button to import parameters files to auto test directory.

### 6.4.3 Script Example

After parameters files are ready, write script file using notepad. The content of script is following:

```
; 2544 user-defined parameters and output file
```

```
AutoTestStartup.exe -st=2012-12-20 23:45:24 -ttype=0 -pf=2544_task1\Port1RFC2544Para1.ini  
-ot=2544report.htm
```

```
if ERRORLEVEL 1 exit
```

Script file names “test\_tc1.bat”.

### 6.4.4 Start and Stop the Test

**Step 1:** Click “AutoTest” icon in the main interface to enter into auto test interface, as is shown in figure 6.4.1.

**Step 2:** Click “Load” button to select test\_tc1.bat.

**Step 3:** Click “Run” to do auto test, as is shown in figure 6.4.2.

Note: If it is not the test time, autotest icon will show in the system area. Test starts up as soon as it is the time.



Figure 6.4.1 Auto Test

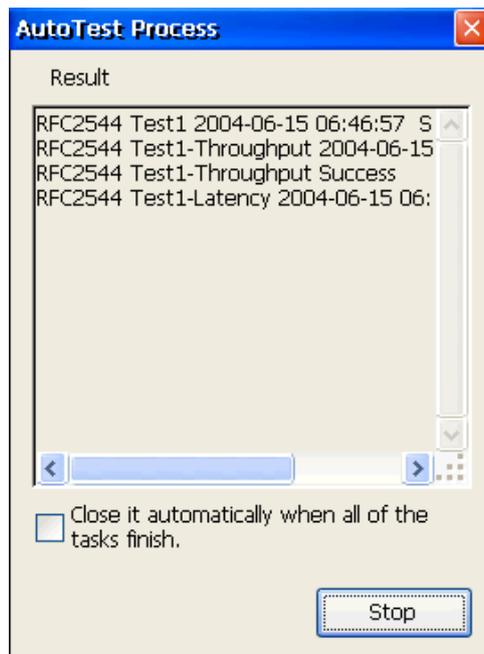


Figure 6.4.2 Process of Autotest

### 6.4.5 Export Test Results

Test report will be saved automatically as soon as test finishes. Report's format is htm. In this example, the name of report is 2544report.htm.

For details please refer to 6.1.7 “Export Test Results”.

---

## Chapter 7 Technical Index

1. Test port: 10/100/1000BASE-T electrical package, 100/1000BASE-X optical package
2. Support protocol: DIX/802.3 SNAP
3. Operation mode: Touch Screen
4. Data storage: SD card (2G)
5. Display: color 4.3”LCD, resolution 480×272 pixels
6. Weight: 1 KG(including battery)
7. Power supply:
  - a) Removable battery, continuous work time is more than 6 hours
  - b) External DC adapter, input 100V~240V 50/60Hz, output 15V/3A
8. Dimensions (length × width × height): 210×110×60 (mm)<sup>3</sup>
9. External interface: USB interface, Ethernet interface and power input.

## Chapter 8 Appendix

### 8.1 DIX Frame Format

DIX frame consists of header, destination address, source address, type, data and FCS. The length of the internal overhead field is fixed; The size of the data field ranges from 46 bytes to 1500 bytes.

6 Bytes	6	2	Length(46~1500)	4
Destination MAC	Source MAC	Frame Type	Data	FCS

## 8.2 802.3 SNAP Frame Format

802.3 SNAP frame consists of destination address, source address, 802.2 DSAP, SSAP, control byte, 802.2 SNAP code, type and FCS. The length of the internal overhead field is fixed; The size of the net load field ranges from 38 bytes to 1492 bytes.

802.3			802.2			802.2 SNAP			
6 Bytes	6	2	1	1	1	3	2	Variable Length (38~1492)	4
Destination MAC	Source MAC	length	DSAP	SSAP	CNTRL	Code	type	data	FCS

## 8.3 VLAN Frame Format

6 Bytes	6	4		2	46~1500	4
Destination MAC	Source MAC	802.1Q		Length/type	data	FCS
		TPID	TCI			

4-byte 802.1Q Tag head includes a 2-byte Tag Protocol Identifier (TPID, its value is 8100), and a 2-byte Tag Control Information (TCI), The TPID is a new type defined by IEEE, which indicating the text with 802.1Q Tag. For details about the 802.1Q Tag head, see the Picture shown below.

### 8.3.1 802.1Q Frame Head Format

VLAN Identified( VLAN ID ): This is a 12-bit domain, indicating the ID of a VLAN. There are altogether 4096 IDs. Each data packet sent out from the 802.1Q protocol supported host contains this domain to indicate which VLAN network it belongs.

Canonical Format Indicator( cfi ): It is the frame format for the data switching between the bus-type Ethernet and the FDDI and token ring networks.

Priority: These 3 bits indicate the priority (PRI) of the frame, which has 8 levels altogether and is

mainly for the judgment of which data packet has priority to be transmitted.

Byte1								Byte2								Byte3				Byte4											
TPID(TAG Protocol Identified)																TCI(Tag Control Information)															
1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	Priority			CFI	VLAN ID											
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

## Chapter 9 Common Problems Solution

Problems	Solution
The system don't start up.	It may be the electrical shortage. You can connect power-supply adapter to check whether the charge indicator lamp lights on.
Can't copy data after U disk is inserted.	Insert U disk, don't wait for a moment until  icon shows. Otherwise, U disk is incompatible with the system. Please try again after changing U disk.
Rx indicator lights on all the time after connecting 1000M electrical package	Check whether the twisted-pair cable is super five cable or super six cable.
Rate indicator don't light on after connecting 100/1000M optical package.	Check port setting to ensure whether interface type is Optical. Ensure whether Tx cable and Rx cable connect correctly. Ensure whether SFP type matches with the other interface's (wavelength and mode). Ensure whether speed or work mode matches with the other interface's.
Check a large number of conflict frames when sending frames.	Check whether test link works in full duplex.

---

## Chapter 10 Contact DADI

### DADI TELECOM

#### Headquarters

**Address:** No.17 Guizhong Avenue, DADI Science & Technologies Park, Liuzhou City,  
Guangxi Province, China

**Post Code:** 545006

**FAX:** +86-772-2632780

**E-mail:** [dadi@lzdd.com](mailto:dadi@lzdd.com)

**Website:** <http://www.lzdd.com>

**Customer Care Center:** +86-772-2633333, 2632728

### DADI TELECOM

#### Beijing Business Centre

**Address:** Room 1601, Building 7, HuaQingJiaYuan, WuDaoKou District, Beijing, China.

**Post Code:** 100083

**FAX:** +86-10-82867177-214

**E-mail:** [bjdd@lzdd.com](mailto:bjdd@lzdd.com)

**Skey:** daditele

**Website:** <http://www.lzdd.com>

**Customer Care Center:** +86-10-82511183