LINEEYE

LE590-TAP

User's Manual

<2nd>

Table of Contents

1. LE590-TAP Overview

For LE-590TX, all data streams between two network ports can be duplicated and sent to PC via mini USB port for monitoring and analyzing. The user can specify conditions to filter the packets wanted with LE590-TAP application software. It reduces USB port's network traffic and also cuts down PC resource consumption while dealing with large quantity of packets.

1.1. Hardware Installation

Before starting LE590-TAP, your PC and LE-590TX shall be connected properly. The figure down below illustrates connecting PC and LE-590TX. You can connect LE-590TX with PC in the same manner.
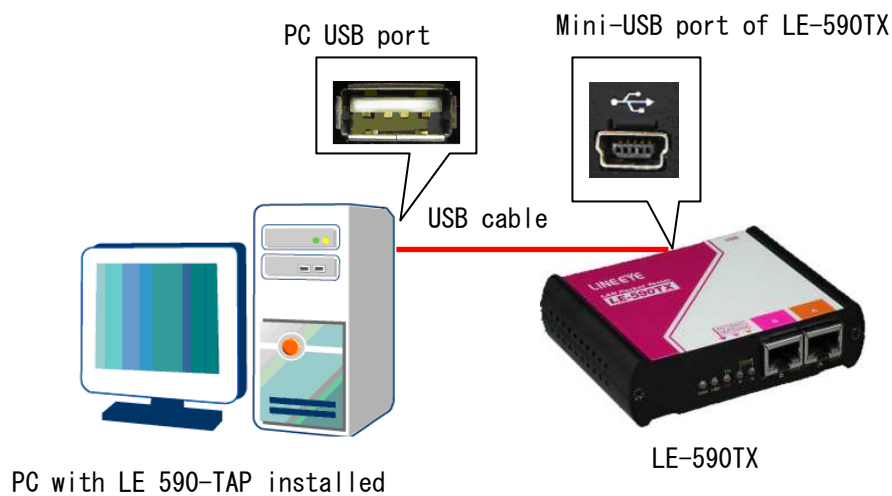
1.2. StartingLE590-TAP
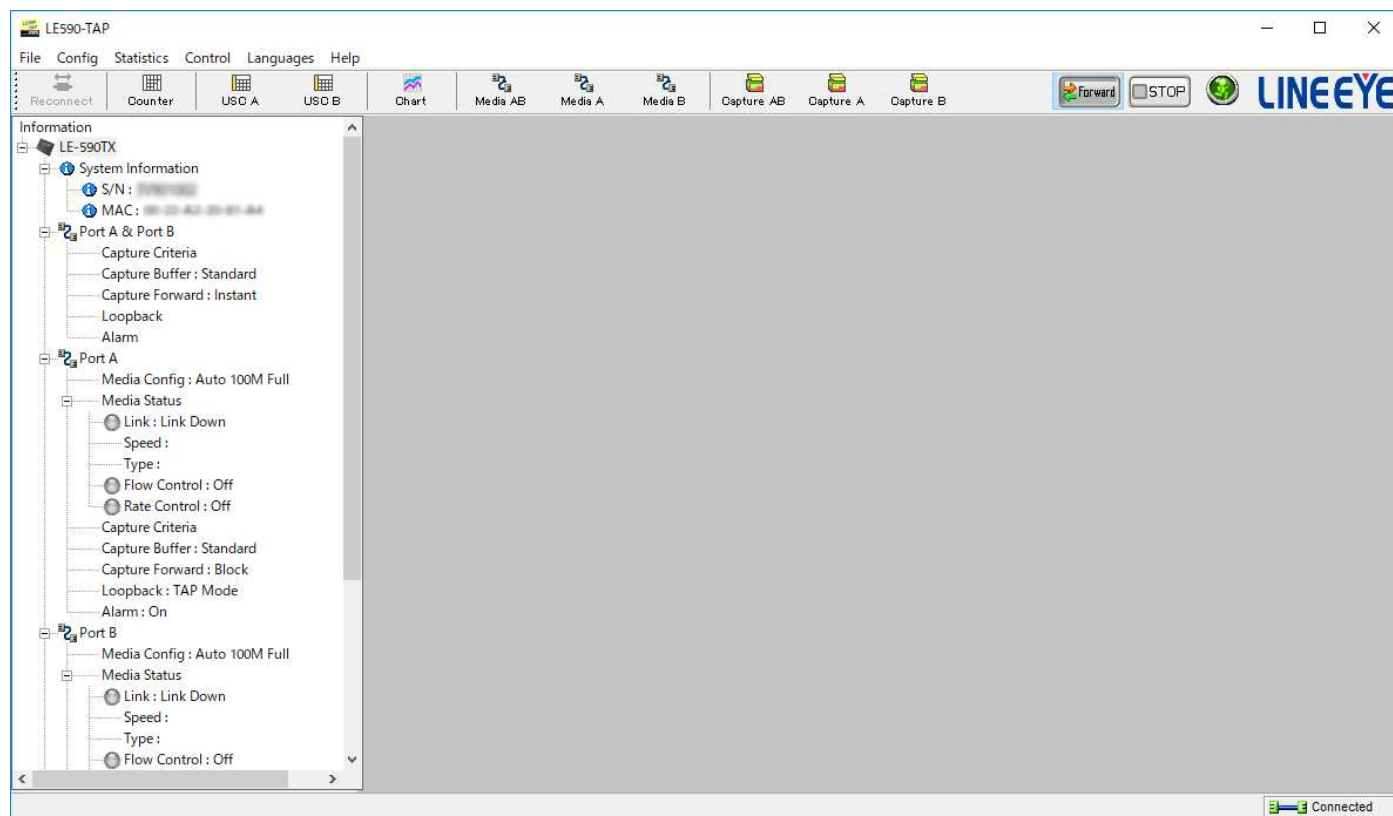
Starting LE590-TAP
• Click Start → Programs → LINEEYE → LE-590TX → LE590-TAP Vxxxxxx →LE590-TAP Vxxxxxx • Double-click LE590-TAP icon located on your PC's desktop.

This manual is for LE590-TAP v1.1b072 or later.

If your PC is not connected with LE-590TX, you can still run LE590-TAP under Demo Mode. Almost all LE590-TAP's functions are available under Demo Mode. However, please note that **Demo Mode is for system demo purposes only**, and does not serve any testing purposes at all.
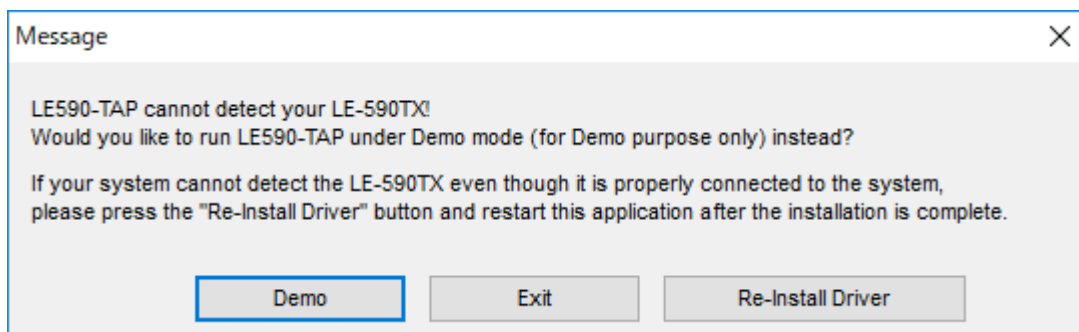
When your PC cannot detect your LE-590TX, a window as shown above will pop up asking if you want to start the LE590-TAP in Demo mode or not, also a third option will pop up asking if you want to re-install WinPcap for successfully run the LE590-TAP.

1.3. LE590-TAP Main Window Overview
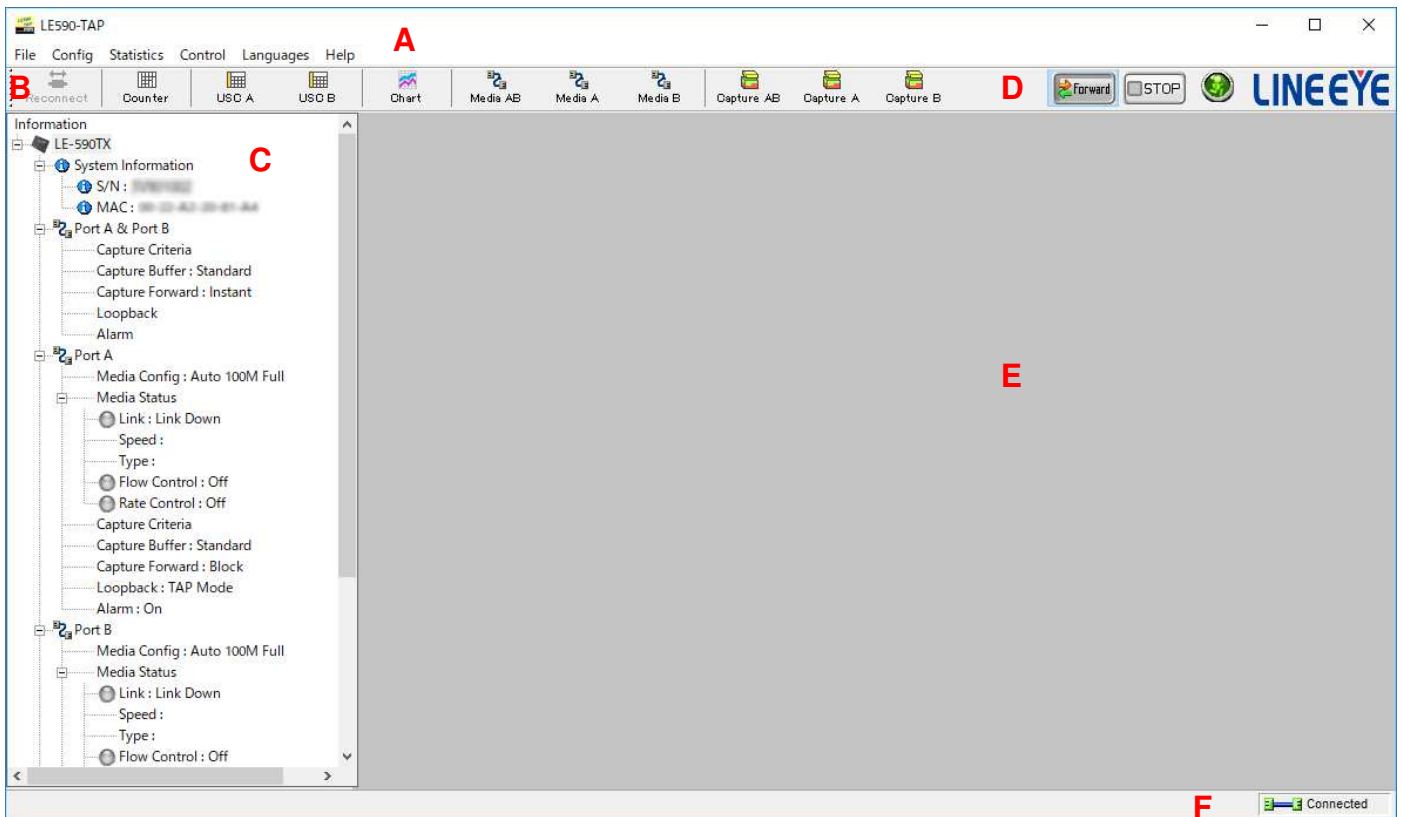
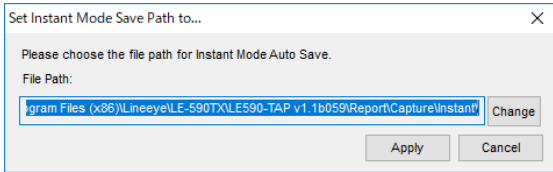| LE590-TAP Functions Overview		
A	Menu Bar	The **Menu Bar** allows you to make settings about task criteria, view Counter window, load/save settings you've made, and change language displayed.
B	Tool Bar	The **Tool Bar** contains buttons that allow you to reconnect your PC to LE-590TX, make task/port configurations, view Counter, USC A/B and Charts.
C	Information Field	In the **Information Field**, you can view system information, making port configurations, or view port and USC status on right side **Main Display Screen**.
D	Control Buttons/ Run Status Icon	The **Control Buttons** allow you to start/stop tasks, and the **Run Status Icon** indicates if there's a task running.
E	Main Display Screen	You can make detail configurations and view real-time testing diagrams on the **Main Display Screen**.
F	System Connection Status	This icon shows the connection status between your PC and LE-590TX.

2. LE590-TAP Functions

2.1. Menu Bar

File   Config   Statistics   Control   Languages   Help

LE590-TAP **Menu Bar** includes configuration options such as **File**, **Config**, **Statistics**, **Contro**l, **Languages**, and **Help**. Please refer to the sections down below for detail information regarding to each configuration option.

2.1.1. File

File	
Load default configuration	If you choose the **Load Default Configuration** option, the system will be restored to the default configuration.
Load Saved Configuration	If you have a previously saved configuration setting file stored in your PC, you can load it and apply all the setting you've made by choosing "**File → Load Saved Configuration**" from the **Menu Bar**. All configuration files are saved in the format of "∗.xml".
Save current configuration	The **Save current configuration** function on the **Menu Bar** allow you to save the settings you've made or the test results. To save the settings you've made, choose **"Save current configuration"** from the **Menu Bar** before performing any tasks, and choose the file path where you would like to save the configuration file. Configuration files are saved in the format of "***.xml**".
Set Instant Mode Save Path to…	 Set Instant Mode Save Path to... ✕ Please choose the file path for Instant Mode Auto Save. File Path: gram Files (x86)\Lineeye\LE-590TX\LE590-TAP v1.1b059\Report\Capture\Instant Change Apply Cancel In this option, you can set the file path for auto save function. Click Change button to choose a new path, and **Apply** button to save the setting, or **Cancel** button to close the window.
Exit	A prompt pop-up window will ask if you are sure to exit LE590-TAP. Click **YES** to exit LE590-TAP, or click **NO** to cancel.

2.1.2. Config
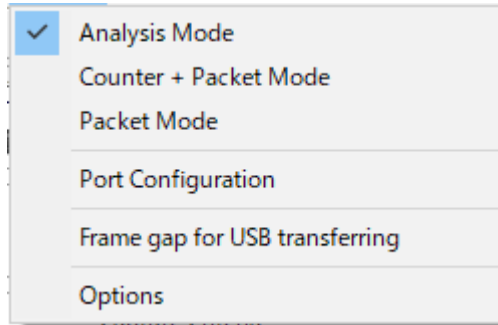
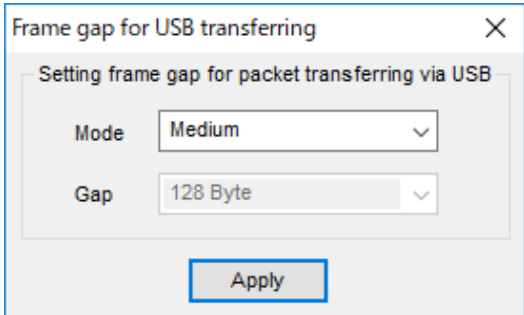### 2.1.2.1. Run Mode

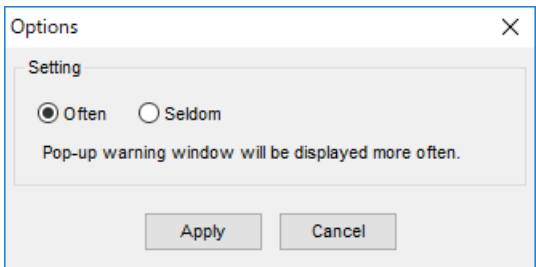| Run Mode	
Analysis Mode	All the function ofLE590-TAP is available.
Counter Mode	The packets capture function and interface will rely on Wireshark software.
Packet Mode	The packets capture function and interface will rely on others software. The Counter table will not show the status of capturing packets.

2.1.2.2.Port Configuration

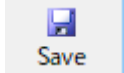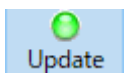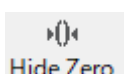| Port Configuration	
	Click the **Flow Control** bar to turn **Port A/B**'s **Flow Control On/Off**. If you turn **ON** the **Flow Control**, the **Rate Control** settings will be available. And when you turn **On** the **Rate Control**, you may set the **Rate** between 0.00~1000.00 Mbps. After **finishing** the settings, please click **Apply** button to save the configuration, or click **Cancel** to close window without saving..
	In this window, you can set if the future warning window will pop up more often by choosing the **Often** option, or pop up less warning window by choosing **Seldom** option. After finishing the settings, please click **Apply** button to save the configuration, or click **Cancel** to close window without saving.

*Note: Changing settings in Port Configuration window might cause Link Status changes and packet loss.

2.1.2.3. Frame gap for USB transferring

Port Configuration	
	Four modes are available in **Frame gap for USB transferring**: **Fast, Medium, Slow and User Define**. If you choose the **User Define** option, the **Gap** scroll field will be available to scroll down and to choose the size of frame gap. After finishing the settings, please click **Apply** button to save the configuration.

2.1.2.4. Options

Options	
	In this window, you can set if the future warning window will pop up more often by choosing the **Often** option, or pop up less warning window by choosing **Seldom** option. After finishing the settings, please click **Apply** button to save the configuration, or click **Cancel** to close window without saving.

*Note: Changing settings in Port Configuration window might cause Link Status changes and packet loss.

2.1.3. Statistics

2.1.3.1. Counter Window

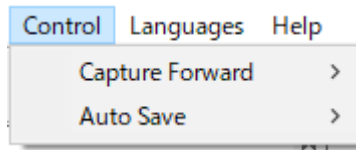| Counter Window	
	Click the **Save** button to save the current counter data.
	The **Update** button allows you to pause or start the counter operation. If the **Update** button is shown as the figure on the left, than the counter operation is paused.
	If the **Update** button is shown as the figure on the left, the counter operation is started.
	Hide the data of zero.
	Show all data.
	Click the **Clear All** button to clear the counter data.

2.1.3.2. Alarm Report
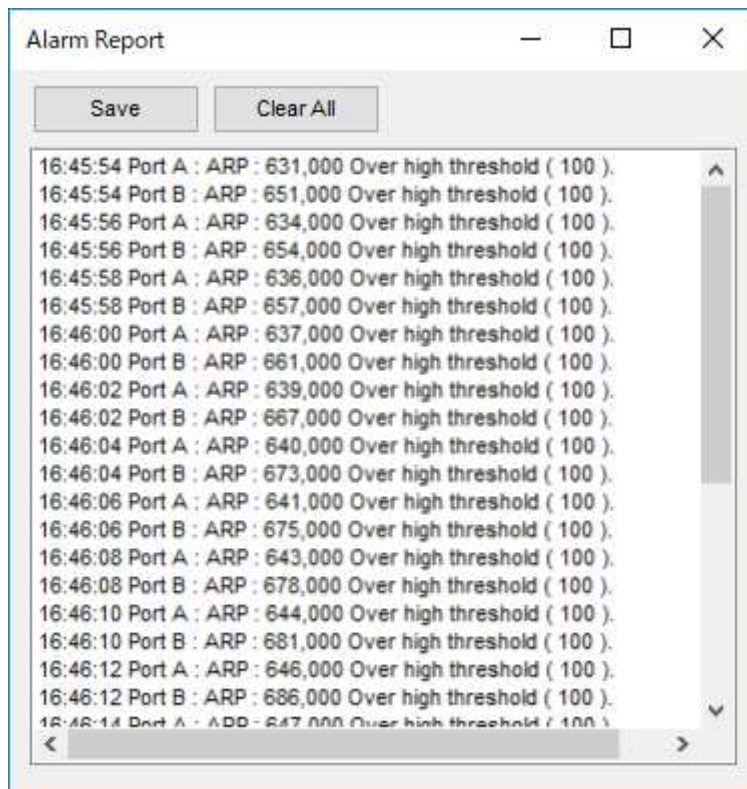
This window will warn you about the over high threshold of the parameter chosen in port configuration, for more detail about how to set the parameter to be presented on Alarm Report window, please refer to the **2.2.5. Port AB, Alarm.**

The **Save** button allows you to save the **Alarm Report** data on a path folder. If you click the **Clear All** button, you will clear all the data gathered on this window.

2.1.4. Control

2.1.4.1. Capture Forward

| Capture Forward	
Block	Records received packets in the internal memory and forwards them to the PC via USB. After capturing data, it is possible to check the captured packets up to 32768 packets (16384 packets for one port). (Set the maximum packets in the "Capture Packet Number" in the Capture Criteria.)
Instant	Received packets are immediately forwarded to the PC via USB. It is possible to check the captured packets while the capture operation. 20000 packets are saved as one file, and the latest 20000 packets are displayed in the screen.

*Note: Data is saved as a pcap format. To check the recorded data, you need to have a software such as Wireshark.
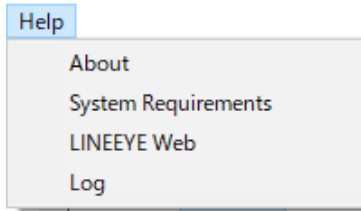
2.1.4.3. Auto Save

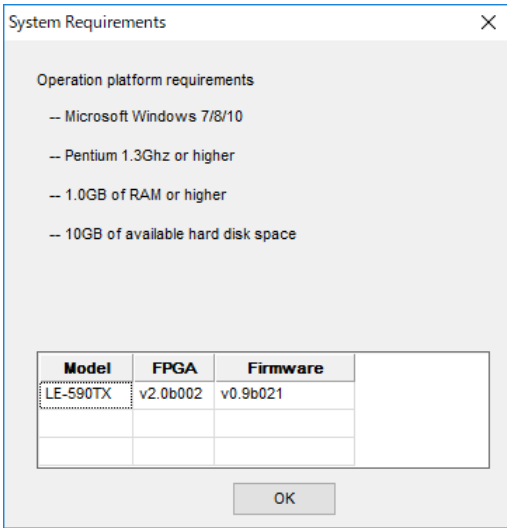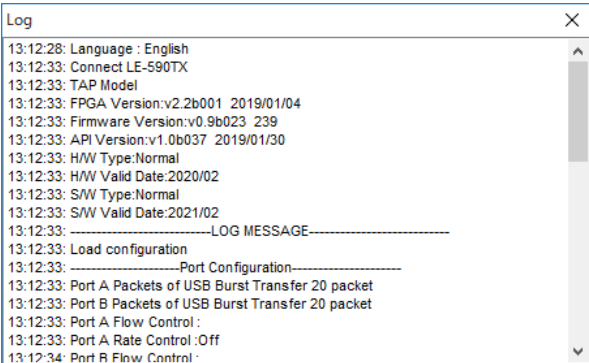| Auto Save	
Chart Data	Click this option to auto save **Chart Data** to the Report folder below your LE590-TAP folder in each 60 min.
Alarm Report	Click this option to auto save **Alarm Report** to the Report folder below your LE590-TAP folder in each 60 min.
Auto Save Setting	
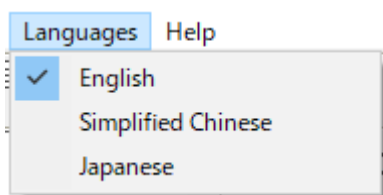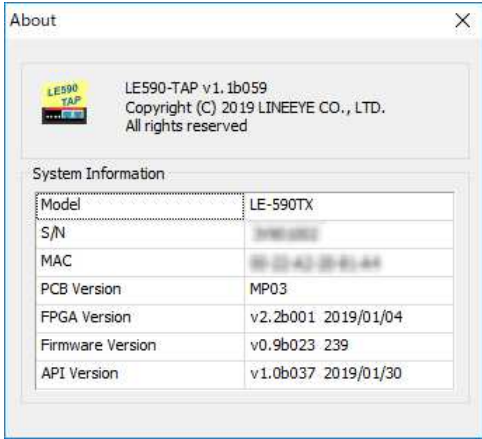
2.1.5. Languages

Languages	
English/Simplified Chinese/Japanese	LE590-TAP has 3 different languages for its UI available. You can set the UI language to English, Simplified Chinese or Japanese.

2.1.6. Help

Help		
About LE590-TAP		An "**About**" window will pop up and show detailed system information.
System Requirements		A "**System Requirements**" window will pop up and show the requirements for your PC, FPGA/Firmware, AP and API version of the equipment. ➢ **OK:** Click this button to exit the "**System Requirements**" pop-up window.
LINEEYE Web	Open your default web browser and access LINEEYE Website（www.lineeye.com）	
Log		Clicking this option will pop up a **LOG** window showing the settings that you made on LE590-TAP program so far.

2.2. Tool Bar
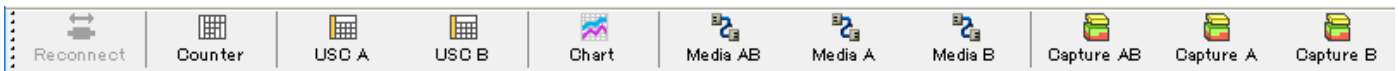
The **Tool Bar** contains buttons that allow you to reconnect LE-590TX, view Counter, view USC A/B, view Chart and Configure Port A/B. Please refer to the section down below for more detail descriptions regarding to **Quick Launch Buttons**.

2.2.1. Reconnect

| Reconnect	
	If the USB connection between your PC and LE-590TX is down, a "**Disconnected**" icon will be shown in "**System Connection Status**". Press **Reconnect** button to re-establish the connection between your PC and LE-590TX. If the connection has been established successfully, a message window will pop up, and the "**System Connection Status**" will be shown as "**Connected**" .

2.2.2. Counter

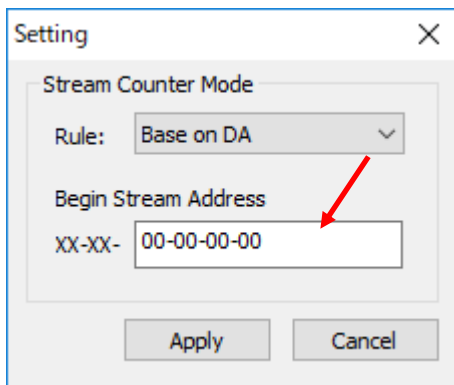| Counter	
	If you click the Counter button, the Counter Window will pop up showing the status of the packets. For more information, please refer to the **2.1.3.1. Counter Window.**

2.2.3. USC A & USC B

USC A/B
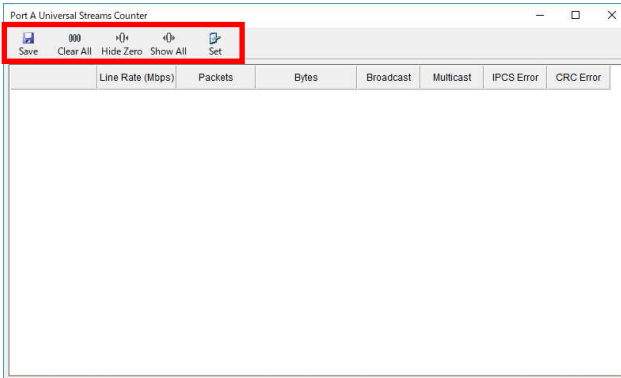
> ![Save] Allows you to save the data of this window.

> ![Clear All] Clear all the data of this window.

> ![Hide Zero] Hide all the data that is zero.

> ![Show All] Show all the data of this window.
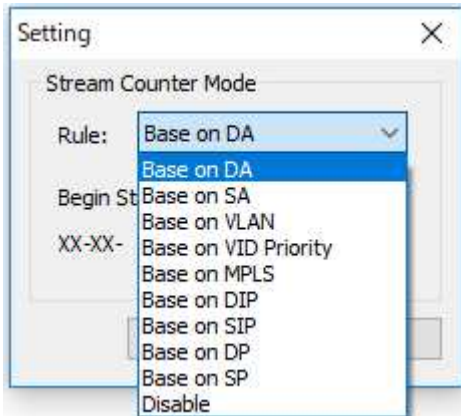
> ![Set] Set the Stream Counter Mode.

Click the ![Set] button to pop up the **Setting** window. In this window, you may modify the **Rule** (Stream Counter Mode) of USC. The chosen mode will be shown in the side pointed by the red arrow.

Click the **Apply** button to save this setting or **Cancel** to close this window without saving.

Note: The Operation mode is not available yet.

The left figure shows the **Rule** (Stream Counter Mode) available when you scroll down the field.

After applying your settings made on the **Setting** window, the changes will be shown on the **Port Universal Streams Counter** window.
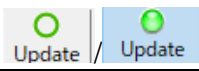
2.2.4. Chart

Chart_Line	
Chart	

Click the **Chart** button to pop up the **Chart** window shown above. From **A** bar, you can click

the Line button to see Packets status in line chart as shown in **B** field. The lines shown in the chart depends on the parameters chosen in **C** field.

You can set the Rate of packets to be analyzed in Mbps in **D** field. If you set in **Auto mode**, the **Rate** will be set under a default setting, if you set in **User Define** mode, than a **Minimum** and a **Maximum** rate range will be available to modify.

You can open a saved chart by clicking the Load button from **A** bar. When opening a saved chart, the **Start**/**End Time** scroll field from **E** will be available. The function of **Start**/**End Time** allows you to check the status of the packets of the saved chart in different times.

The **Update** button Update / Update allows you to pause or start the counter operation.

Chart_Pie

Click the [Pie] button as shown in **A** to view the pie chart in **B** field. The pie chart shows the percentage of each captured packet size during the operation of the **LE590-TAP**.

You can set the Rate of packets to be analyzed in Mbps in **C** field. If you set in **Auto mode**, the **Rate** will be set under a default setting, if you set in **User Define** mode, than a **Minimum** and a **Maximum** rate range will be available to modify.

You can open a saved chart by clicking the [Load] button. When opening a saved chart, the **Start/End Time** scroll field from **D** will be available. The function of **Start/End Time** allows you to check the status of the packets of the saved chart in different times.

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Chart_Bar

Click the [Bar] button as shown in **A** to view the bar chart in **B** field. The Bar chart shows the rate of network event counts from Port A to Port B and Port B to Port A. Those includes: BC (Layer 2 Broadcast), MC (Layer 2 Multicast), UC (Layer 2 Unicast), VLAN, IPv4, ICMP (Ping), ARP, PAUSE.

You can set the Rate of packets to be analyzed in Mbps in **C** field. If you set in **Auto mode**, the **Rate** will be set under a default setting, if you set in **User Define** mode, than a **Minimum** and a **Maximum** rate range will be available to modify.

You can open a saved chart by clicking the [Load] button. When opening a saved chart, the **Start/End Time** scroll field from **D** will be available. The function of **Start/End Time** allows you to check the status of the packets of the saved chart in different times.

2.2.5. Port AB

Port AB_Media Type	
	Port A & Port B : Media Config
Media AB	Click the **Port AB** button to pop up the Port AB configuration interface. In this interface, you can set the **Media type** as **Auto** or **Force** mode.

Click the **Port AB** button to pop up the Port AB configuration interface. In this interface, you can set the **Media type** as **Auto** or **Force** mode.

The **Auto** mode enables to choose the rate in 10/100M under Half/Full duplex, but it may be auto modified by the LE590-TAP program to a best rate to run.

The **Force** mode enables to choose and fix the transfer rate in 10/100M under Full duplex.

You can also set **MDIX** mode here, and click the **Set** button to save settings made for **MDIX** mode:

➢ If you set **Auto MDIX** mode, the LE590-TAP will auto sense the direction of Tx/Rx for signal connection between **LE-590TX** with **NIC**/**Switch** side.

➢ You can choose **Force MDI (NIC side)** to force the direction of the Tx/Rx signal based on NIC side.

➢ You can choose **Force MDI-X (Switch side)** to force the direction of the Tx/Rx signal based on Switch side.

Click the **Apply** button to save the settings, or **Cancel** button to recover to the default configuration.

Port AB_Capture Criteria
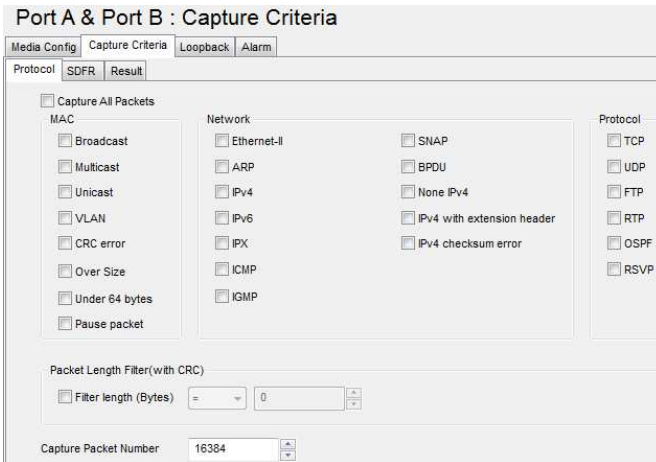
In the **Protocol** interface, If you click the **Capture all packets** function, you will enable the LE590-TAP to capture all packets criteria.

If you close the **Capture all packets** function, than the criteria from **MAC**, **Network** and **Protocol** will be available to choose.

The **Packet length filter** allows you to filter packets as equal, less than, greater than and not equal to a range of packets of 52~16384 bytes.

Set the maximum number of captured packets (20-16384) in the "Capture Packet Number" if the Capture Forward setting is "Block".
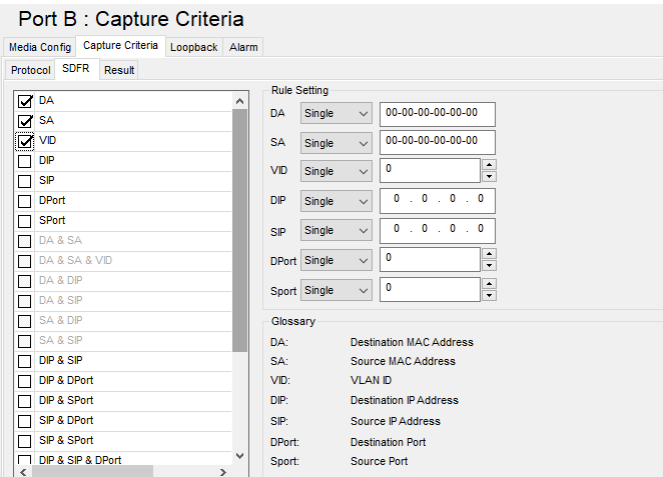
SDFR (Self-Discover Filtering Rules).

If you closed the **Capture all packets** function in the **Protocol** interface, the **SDFR** interface will be available for settings.

The SDFR interface allows you to choose a single or multiple criteria for capturing packets.
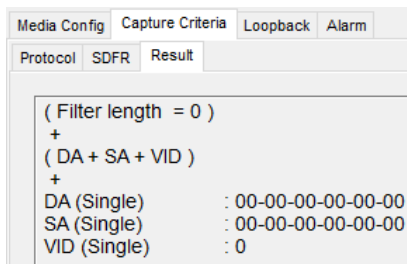
It shows the result of capture criteria by user's selection.

*Note: Packet loss is possible if the captured traffic is higher than traffic allowed for USB port.
*Note: For SDFR items, you can tick the items that act as criteria. When you tick one option, some other options will be gray. It means the option what you tick has covered the range of those options in gray.
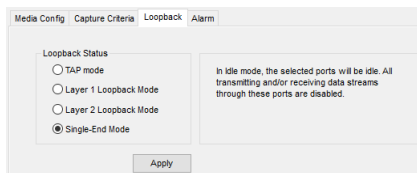
Port AB_Loopback

Media AB
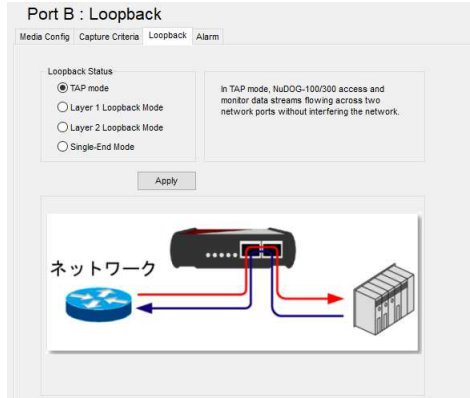
If you choose the **TAP mode** on **Loopback** interface, the LE-590TX, operates like a hardware device that provides a method to access and monitor the data streams flowing across two network ports without intruding the running network.
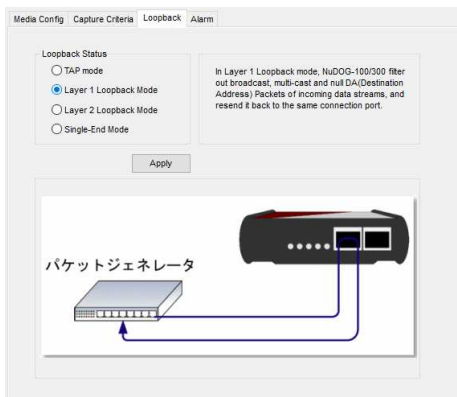
If you choose the **Layer 1 Loopback Mode** on **Loopback** interface, the LE-590TX, filters out broadcast, multicast and null DA (destination address) packets of incoming data streams, and then resends them back to the same connected port.
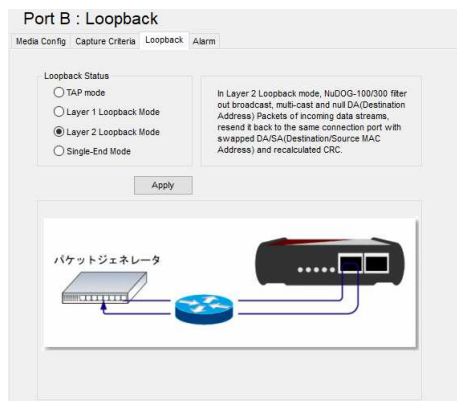
If you choose the **Layer 2 Loopback Mode** on **Loopback** interface, the LE-590TX, filters out broadcast, multicast and null DA (destination address) packets of incoming data streams, and then resends them back to the same connected port with swapped DA / SA (destination / source MAC address) and recalculated CRC.

If you choose the **Single-End Mode** on **Loopback** interface, the selected ports are idle that all transmitting and/or receiving data streams via these ports are disabled.

Port AB_Alarm

In the Alarm interface, you can choose the alarm threshold to be displayed on the alarm report. When the check box is ticked as ☑ , these alarm criteria are enabled if the network event of the running network is beyond the threshold.

Click ▲ or ▼ of [icon] button to increase or decrease the value of threshold as the limit to starting the alarm report.

When the network traffic flows through this device and the network event triggers the alarm threshold, the alarm condition is registered in alarm report.

The Settings of [Media AB] will configure the Port A and Port B at same time with the same packets capture criteria. If you want to configure Port A and Port B at different packets capture criteria, please choose the [Media A] and [Media B] to configure separately with different packets capture criteria.
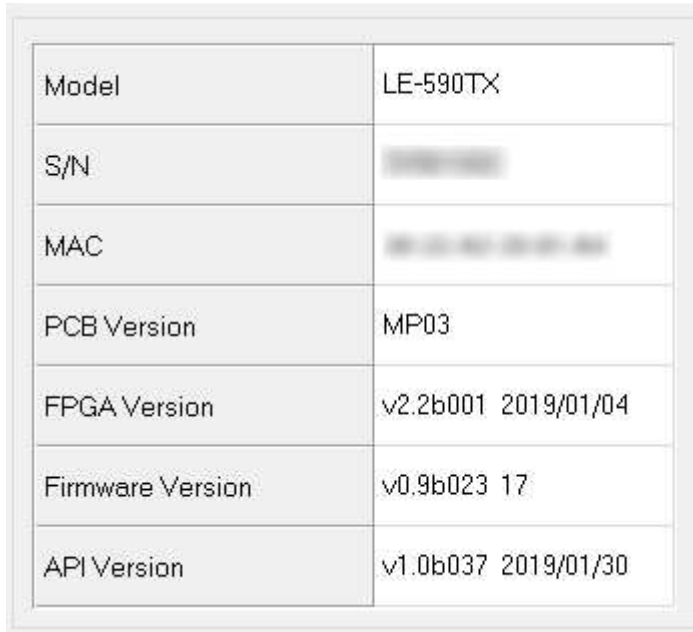
2.3. System Info/Configuration List
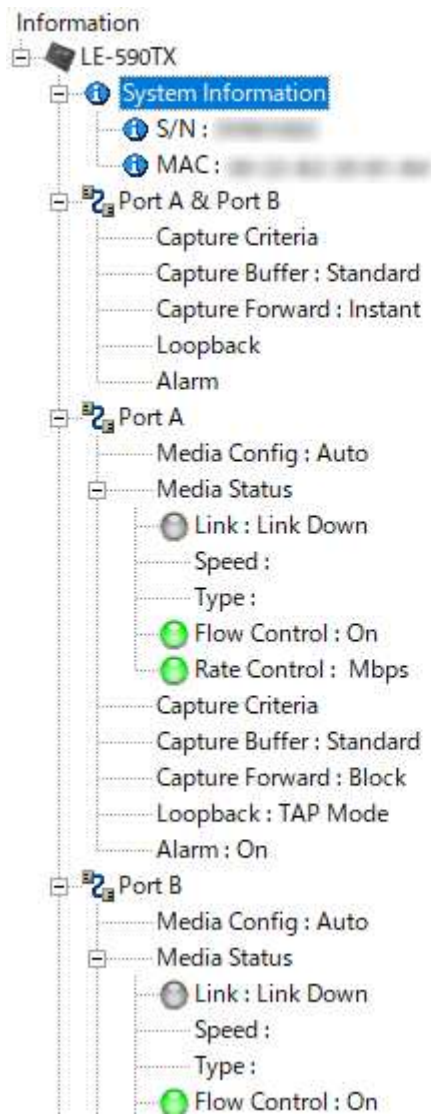
The **System Info/Configuration List** allows you to view system information and making port configurations.
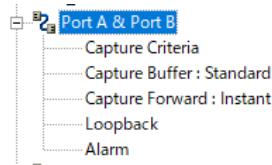
2.3.1. System Information

By clicking the **System Information** on the **System Info**/**Configuration List**, the **System Information** screen will be shown on the **Main Display Screen** located on the right side of LE590-TAP' main window.

Model	LE-590TX
S/N	
MAC	
PCB Version	MP03
FPGA Version	v2.2b001 2019/01/04
Firmware Version	v0.9b023 17
API Version	v1.0b037 2019/01/30

2.3.2. Port A & Port B

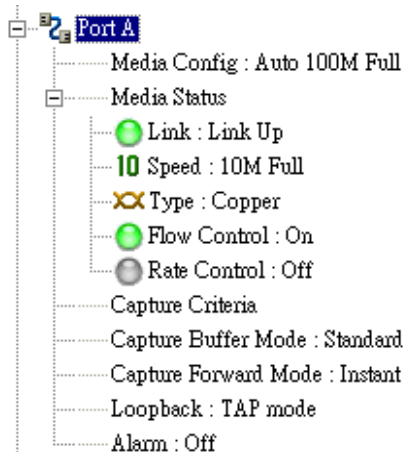**Media Type**, **Capture Criteria**, **Loopback and Alarm**

By clicking the **Port A & Port B** on the **System Info**/**Configuration List**, the **Port A & Port B Configuration** screen will be shown on the **Main Display Screen** located on the right side of LE590-TAP' main window, allowing you to make settings for LE-590TX ports.

Those settings include the **Media Type**, **Capture Criteria**, **Loopback** and **Alarm** related to .

For more detail description about **Port A & Port B Configuration**, please refer to **2.2.5. Port AB**.

2.3.3. Port A / Port B

2.3.3.1. Media Type, Capture Criteria, Loopback and Alarm

By clicking the **Port A** or **Port B** on the **System Info**/**Configuration List**, the **Port A** or **Port B** **Configuration** screen will be shown on the **Main Display Screen** located on the right side of LE590-TAP' main window, allowing you to make settings for LE-590TX ports.

Those settings include the **Media Type**, **Capture Criteria**, **Loopback** and **Alarm** related to and . Besides, the change on the status of **Media Type**, **Capture Criteria**, **Loopback** and **Alarm** are also shown in the **System Info**/**Configuration.**

For more detail description about **Port A or Port B Configuration**, please refer to **2.2.5. Port AB**.
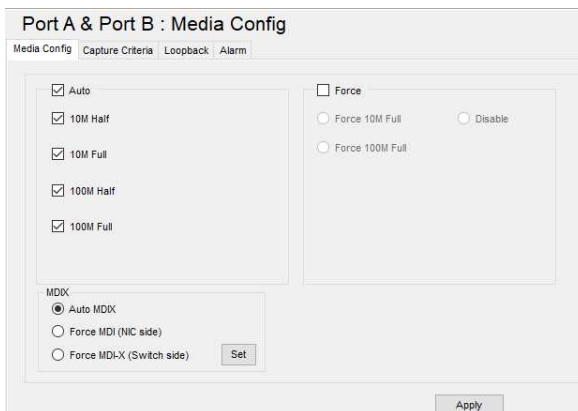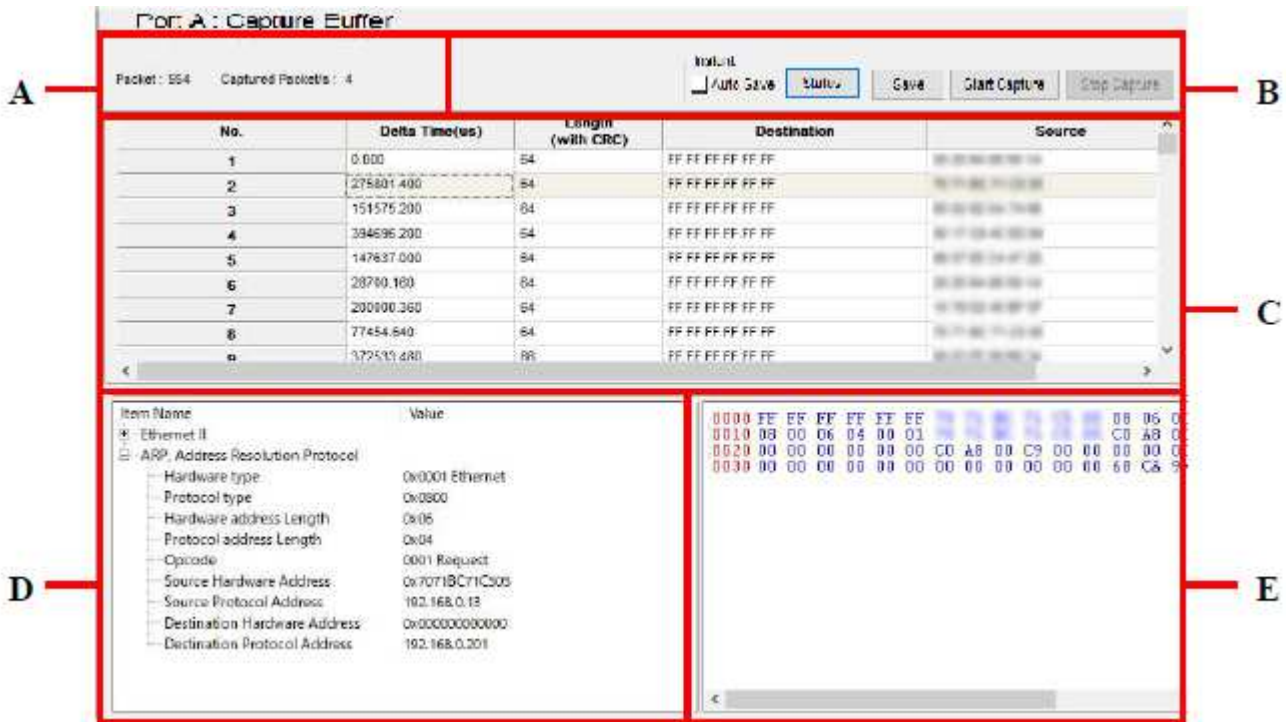

2.3.3.2. Media Status

By clicking the **Media Status** on the **System Info**/**Configuration List**, it will show the status of **Link**, **Speed**, **Mode**, **Type**, **Flow Control and Rate Control**.

Link	Link Up
Speed	100M
Mode	Full-dulpex
Type	Copper
Flow Control	On
Rate Control	100.00 Mbps

2.3.3.3. Capture Buffer Mode and Capture Forward Mode

A: This field shows the number of packets and number of captured packets.

B: If you set **Capture Forward Mode** under **Instant** mode, this field will be available for settings:

> You can enable **Auto Save** by clicking the check box, and see the status of captured packets on a designated folder by clicking **Status** button. Or you can save the instant status by clicking the **Save button**.

> You can also initiate the packets capture operation by clicking **Start Capture** button, and stop the packets capture operation by clicking the **Stop Capture** button.

C: In this field, you can check the status of each captured packet based on the order of packet (**No.**), **Delta Time(us)**, **Length(with CRC)**, **Destination**/**Source** MAC address, **VLAN**, **Protocol** and **Destination**/**Source IP**.

D: This field shows the packet/frame view items, such as Ethernet II. User can click ⊞ to expend the sub-tree on the **Item Name** column, and see the value of network frame on the **Value** column.

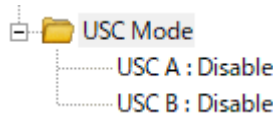**E:** Shows the data based on the field **C**.

* Both "Instant" and "Block" setting includes FCS in the captured data.

* "Block" setting cannot save captured data automatically.

* While capturing in the port A or port B, do not capture in the port A & port B.

* While capturing in the port A & port B, do not capture in the port A or port B.

2.3.4. Report: USC A/B

The **Report** shows the **Rule** chosen on the **Stream Counter Mode** settings for each **USC A** and **USC B**. Please refer to the **2.2.3. USC A & USC B** for more details.

2.4. Control Buttons/ Operating Status Icon

2.4.1. For TAP mode

The **Control Buttons** allow you to start/stop tasks, and the **Operating Status Icon** indicates if there's a task running.

Control Buttons	
	Start task
	Stop task

Operating Status Icon	
	Not operating
	Operating

2.4.2. For Layer 1/Layer 2 Loopback mode and Single-End mode

The **Control Buttons** allow you to start/stop tasks, and the **Operating Status Icon** indicates if there's a task running.

Control Buttons	
	Start task
	Stop task

Operating Status Icon	
	Not operating
	Operating

M-29590TAPE/LE