

PROFITAP

PROFISHARK **10G** 10G Fiber Network Troubleshooter



USER MANUAL
www.profitap.com

Package contents

- 1 x ProfiShark 10G main unit
- 1 x USB key containing drivers, software and manual
- 1 x USB 3.0 cable
- 1 x Carrying pouch

For any questions, technical or otherwise,
contact our customer support
through our website:

<http://www.profitap.com/contact-us/>

or by email:

info@profitap.com

For the latest documentation and software,
visit our Resource Center:

<http://www.profitap.com/resource-center/>

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General Information



The ProfiShark 10G is a portable fiber optic TAP and troubleshooter, and provides visibility into 10G fiber optic networks. It accepts two SFP+ modules (SR, LR, ER), and sends the incoming traffic to a USB 3.0 output.

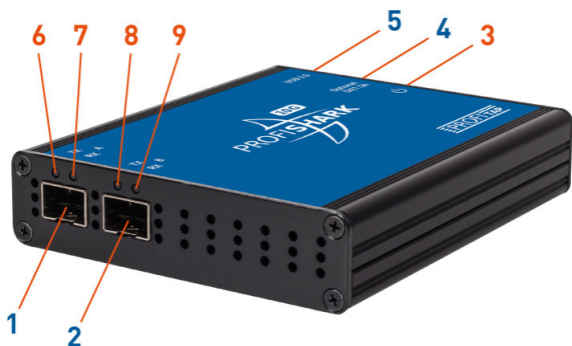
The ProfiShark 10G can be set to either SPAN or In-Line mode. SPAN mode receives traffic from any connected SFP+ modules, while In-Line mode receives and transmits traffic between both ports.

The ProfiShark 10G captures packets of all sizes and types, and provides real time traffic statistics, SFP+ module and fiber information, and various traffic capture settings and options. It also incorporates hardware filters, deep packet inspection, and packet slicing.

Features

- 10G fiber monitoring on USB 3.0
- USB 3.0 powered, no adapter required
- Hardware aggregation
- SPAN and In-Line modes
- Capture any type of frames
- Hardware filtering, deep packet inspection
- Packet slicing
- 8 ns hardware timestamping for accurate latency testing
- Customizable real time statistics
- In-depth network port diagnostic
- Low level error and bandwidth monitoring
- Direct capture to disk
- Invisible to the network
- Lightweight and highly portable build
- Quick setup and easy to use

ProfiShark 1G Visual Description



- 1 - Port A (SFP+) connected to the network
- 2 - Port B (SFP+) connected to the network
- 3 - Power indicator LED
- 4 - USB 3.0 connector linked to your monitoring device (i.e. a laptop computer)
- 5 - Optional DC input (5V/1A)
- 6 - 7 - 8 - 9 - The SFP+ or network status is displayed on the front LEDs.

SFP+ and network status:

	A RX+TX or B RX+TX	A RX or B RX	A RX+TX and B RX+TX
Orange	No SFP	-	No SFP
Green steady	-	SPAN mode, link established	In-line mode, link established
Green slow blink	No link	-	No link
Green fast blink	-	SPAN mode, link activity	In-line mode, link activity

ProfiShark Manager and Driver Installation

Windows

The ProfiShark Manager and ProfiShark drivers for Windows are available for Windows 7, 8, and 10, 32/64 bits. They are combined in the same package.

To install the ProfiShark Manager and Drivers, execute the setup utility located in the "Windows" folder of the USB flash drive. Please make sure any previous version of the ProfiShark Manager has been uninstalled before starting the setup utility. The setup utility will create a launch icon in your start menu.

The ProfiShark drivers should install when a ProfiShark unit is connected to the computer, during or after the ProfiShark Manager installation.

For a manual installation, the drivers can be found in the default installation folder:

C:\Program Files (x86)\Profitap\ProfiShark Manager\Driver\PT3

If the ProfiShark unit doesn't appear in the list of network devices, the list may be refreshed using the following command lines in a *cmd.exe* window:

- *net stop npf*
- *net start npf*

The latest software releases can be found in the Profitap Resource Center, at:

<http://www.profitap.com/resource-center/>

Linux

To install the ProfiShark Manager and Drivers on Linux, follow the instructions in the *Installation.txt* file located on the USB flash drive.

Analyzer Installation

Any of the compatible analyzers can be used to perform the analysis. Compatible analyzers are listed on the ProfiShark 10G product page at: www.profitap.com/profishark-10g

Wireshark is recommended and can be downloaded at: www.wireshark.org

To start capturing network data, launch your preferred network analyzer and select the ProfiShark network interface. Refer to your analyzer's user manual to learn more about how to select a network interface.

ProfiShark Manager

ProfiShark Manager is an application developed by Profitap, designed for use in parallel with traffic analyzers (Wireshark, ClearSight, ...).

ProfiShark Manager adapts its interface to the connected ProfiShark unit model. If multiple ProfiShark units are connected, ProfiShark Manager adapts to the unit whose MAC address is selected at the top right corner of the ProfiShark Manager window.

The ProfiShark 10G version provides:

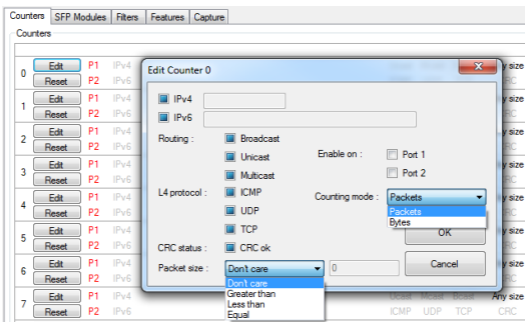
- configurable counters for real-time statistical network analysis
- real-time SFP module and fiber optic status information
- SPAN mode/in-line mode option
- hardware filters and deep packet inspection
- capture options such as packet slicing (128 bytes), high resolution timestamps (8 ns), CRC error transmission, and CRC32 preservation
- ProfiShark unit information and firmware flashing utility
- Direct capture to disk function

ProfiShark Manager can be used simultaneously with a software network analyzer, without the need to interrupt data capture.

ProfiShark 10G Manager

Counters — Traffic statistics

The *Counters* tab contains configurable counters for statistical network traffic analysis and diagnostic.



SFP Modules — Port diagnostic and control

The *SFP Modules* tab provides real-time information about the connected SFP modules and optical fiber.

The *Ports Control* section allows the switching between *SPAN mode* and *in-line mode*. In *SPAN mode*, traffic is only received, on either or both ports. In *in-line mode*, traffic is transmitted between both ports. A *loopback* option is also available.

Counters SFP Modules Filters Features Capture

Status
Port A
Port B
Port A
Port B

Status	Present		Present		Identifier	SFP or SFP+		SFP or SFP+	
Vendor name	Cisco Systems, Inc.		Cisco Systems, Inc.		Ext. Identifier	0x04		0x04	
Vendor OUI	08005C		08005C		Connector	LC		LC	
Model	GLX-SFP-10G-SR		GLX-SFP-10G-SR		Transceiver				
Revision	A		A		Wavelength	850 nm		850 nm	
Date code	04-21-2015		04-21-2015		Options				
Serial number	W123456789		W123456789		Diagnostic monitoring type	Int. calibrated/Av. power		Int. calibrated/Av. power	
					Enhanced options				
					SFF-8472 compliance	Rev 10.2 SFF-8472		Rev 10.2 SFF-8472	
Bitrate, nominal	10300 Mbps		10300 Mbps		Length 9/125µm fiber	Unspecified		Unspecified	
Upper bitrate margin	Unspecified		Unspecified		Length 50/125µm OM2 fiber	80m		80m	
Lower bitrate margin	Unspecified		Unspecified		Length 62.5/125µm OM1 fiber	30m		30m	
Encoding	64B/66B		64B/66B		Length copper and active cable	Unspecified		Unspecified	
Rate ID	Unspecified		Unspecified		Length 50/125µm fiber	300m		300m	

	Port A					Port B				
	Low Alarm	Low Warning	High Warning	High Alarm	Value	Low Alarm	Low Warning	High Warning	High Alarm	Value
Temperature	-13.0°C	-8.0°C	73.0°C	78.0°C	39.4°C	-13.0°C	-8.0°C	73.0°C	78.0°C	42.2°C
Vcc	2.90V	3.00V	3.60V	3.70V	3.23V	2.90V	3.00V	3.60V	3.70V	3.23V
TX Bias	4.000mA	5.000mA	12.600mA	13.200mA	8.134mA	4.000mA	5.000mA	12.600mA	13.200mA	8.504mA
TX Power	0.2512mW	0.3162mW	0.7943mW	1.0000mW	0.5219mW	0.2512mW	0.3162mW	0.7943mW	1.0000mW	0.5603mW
RX Power	0.0100mW	0.0158mW	0.7943mW	1.0000mW	0.0007mW	0.0100mW	0.0158mW	0.7943mW	1.0000mW	0.0012mW

Warnings	RX Power					Warnings	RX Power				
Alarms	RX Power					Alarms	RX Power				
Status Bits	RX LOS					Status Bits	RX LOS				

Ports Control

Span Mode Save

Loopback

Filters — Hardware filters and DPI

The *Filters* tab gives access to the ProfiShark's hardware filters and deep packet inspection feature. When enabled, only the packets matching the filters and DPI will appear in *Live Capture* and *Direct Capture*.

The screenshot shows the 'Filters' tab with the following configuration:

- Filter:**
 - MAC: Specify source or destination
 - IP: IPv6 Specify source or destination
 - Port: Specify source or destination
 - Enable filter
 - Buttons: Set, Save
- Deep Packet Inspection:**
 - Keep packets containing:
 - Enable deep packet inspection
 - Buttons: Set, Save

Features — Capture options and unit information

The *Features* tab regroups information about the driver and firmware version, port status, the firmware update utility, and a way to enable or disable certain ProfiShark 10G features.

The screenshot shows the 'Features' tab with the following information and controls:

- System Information:**
 - ProfiShark 10G Connected
 - Driver Version : 0.1.3.18
 - SW Firmware Version : 0.2.3.8
 - HW Firmware Version : 0003
 - MAC Address : 00:1e:c0:fc:b0:87
 - Module Present / Module Present
 - Software Dropped Packets : 0
 - Hardware Dropped Packets : 0
 - Link Up Duration : -
 - Last Link Down Duration : -
- Firmware Update:**
 - File selection: Browse
 - Flash Firmware:
- Capture Format:**
 - Enable timestamps in live capture
 - Transmit CRC Errors
 - Keep CRC32
 - Disable Port A
 - Disable Port B
 - Packet Slicing
 - Buttons: Save, Reset Device

ProfiShark 10G Connected:

Lists the model of ProfiShark and its state: Connected, Disconnected, or Upgrading Firmware.

Driver Version:

The version of driver software currently communicating with the ProfiShark.

SW Version:

The version of ProfiShark Manager currently running.

HW Firmware Version:

The version of ProfiShark firmware currently loaded into the ProfiShark device.

MAC Address:

A unique identifier burned into the ProfiShark device.

SFP+ Transceiver:

Declares the status of the (2) SFP+ ports, reporting whether a transceiver is Present or Not Present.

Software Dropped Packets:

This counter increments when ProfiShark Manager realizes that it is dropping frames due to insufficient resources, typically CPU or disk write performance on the hosting PC.

Hardware Dropped Packets:

This counter increments when ProfiShark Manager realizes that the ProfiShark device is dropping frames. Hardware filtering and packet slicing can be used to prevent this.

Link Up Duration:

The time which has elapsed since the ProfiShark device saw the Link signal go up.

Link Down Duration:

The time which has elapsed since the ProfiShark device saw the Link signal go down.

NOTE Only one of Link Up Duration or Link Down Duration will report a value.

To update the ProfiShark 10G firmware, press the *Browse* button, select the appropriate firmware file and press the *Flash Firmware* button.

The corresponding firmware update will begin. The ProfiShark Manager cannot be used while the update is in progress. The update process can take a few minutes to complete. Unplug and replug the ProfiShark device to use the new firmware. Do not disconnect the USB port or shut your computer down during the update process.

The latest firmware can be downloaded from the Resource Center at:

www.profitap.com

The following features can be turned on and off:

Enable timestamps in live capture:

If checked, a Unix formatted timestamp is adjoined at the end of the packet data, after the FCS. This timestamp can be interpreted by the Profitap Wireshark dissector in live capture mode.

Unix timestamp format: the 64-bit timestamp is organized in two 32-bit words, representing the seconds since 01/01/1970, and the fraction of second.

Transmit CRC Errors:

If checked, the ProfiShark will not filter out network packets with CRC errors like a normal NIC would.

Keep CRC32:

Keep the CRC32 information (32-bit Frame Check Sequence) located at the end of the packets. FCS can be interpreted in Wireshark (Edit -> Preferences -> Protocols -> Ethernet -> Assume packets have FCS).

Disable Port A:

If checked, the frames which input on port A are not captured.

Disable Port B:

If checked, the frames which input on port B are not captured.

Packet Slicing:

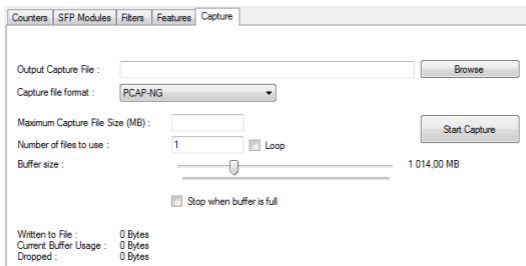
If checked, the first 128 bytes of each frame are captured.

NOTE If the "Packet Slicing" feature is enabled, the hardware automatically disables the "Keep CRC32" feature. No padding is added to frames smaller than 128 bytes.

NOTE If both "Transmit CRC Errors" and "Keep CRC32" are enabled, all erroneous packets will be treated as correct ones.

Capture — Direct capture to disk

ProfiShark 10G provides the option to capture traffic without the need for third-party capture software. This mode of capture is performed on a driver level, prior to all network stacks and frame processing. With the support of direct capture, small packet capture can be performed at wire speed.



The screenshot shows the 'Capture' configuration window in ProfiShark 10G. The window has a tabbed interface with 'Counters', 'SFP Modules', 'Filters', 'Features', and 'Capture' tabs. The 'Capture' tab is active. The configuration options include:

- Output Capture File :** An empty text input field with a 'Browse' button to its right.
- Capture file format :** A dropdown menu currently set to 'PCAP-NG'.
- Maximum Capture File Size (MB) :** An empty text input field.
- Number of files to use :** A text input field containing '1' and a 'Loop' checkbox.
- Buffer size :** A slider control with a handle in the middle. The right end of the slider is labeled '1 014.00 MB'.
- Stop when buffer is full :** An unchecked checkbox.
- Statistics:** A section at the bottom left showing 'Written to File : 0 Bytes', 'Current Buffer Usage : 0 Bytes', and 'Dropped : 0 Bytes'.

The capture file is saved in PCAP Next Generation format (.pcapng).

The packet timestamps are hardware generated with 8 nanosecond accuracy. The direct capture feature is compatible with the different hardware features: "Packet Slicing", "Transmit CRC errors", "Keep CRC32", "Disable Port" (see "Features" chapter).

Direct Capture Setup

Output Capture File:

Specify the name and location of the capture file. Name extension will be added to the specified name (`_#####_YYYYMMDDHHMMSS`).

Maximum Capture File Size (MB):

The capture will stop when the file reaches the specified size in MB.

Loop:

If selected, the capture does not stop. The files are erased to keep the specified amount of capture files. A round-robin capture can be done, with one or multiple files.

Number of files to use:

Specify the amount of capture files to be created.

Start Capture:

When capture isn't running, starts the capture with the specified parameters.

Stop Capture:

When capture is running, stops the capture and releases the capture file.

Written to File:

Indicates the amount of data written in the Output Capture File.

Current Cache Usage:

Indicates the RAM cache's current usage.

Dropped:

Indicates the amount of data dropped during the capture.

NOTE The amount of dropped data depends on the data storage throughput and the amount of RAM cache. Disk arrays or SSDs can drastically improve capture performance.

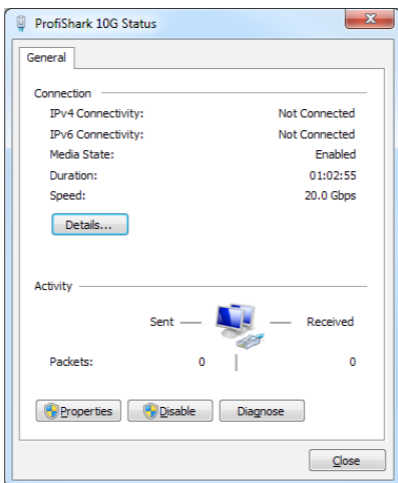
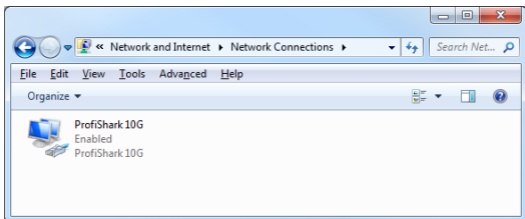
Packet Capture

ProfiShark 10G has the ability to capture:

- Any type of frames (VLAN, VXLAN, MPLS, Pause frames, etc.)
- Any encapsulated frames
- CRC errors frames
- Short frames (< 64 bytes)
- Jumbo frames (> 1518 bytes)
- Any frames between 10 bytes and 10 Kbytes

Once the drivers have been properly installed, a new connection is added in the Network Connection panel. ProfiShark 10G acts as a 20 Gbit/s unidirectional NIC, regardless of the network connection speed. Frame aggregation is done in the ProfiShark hardware and respects the original frame order. As opposed to FIFO (First In, First Out), the ProfiShark 10G employs an FCFS (First Come, First Served) mechanism.

A reboot of the computer may be required to refresh the Winpcap/Wireshark device list. ProfiShark 10G has been tested with all major capture/analyzer software.

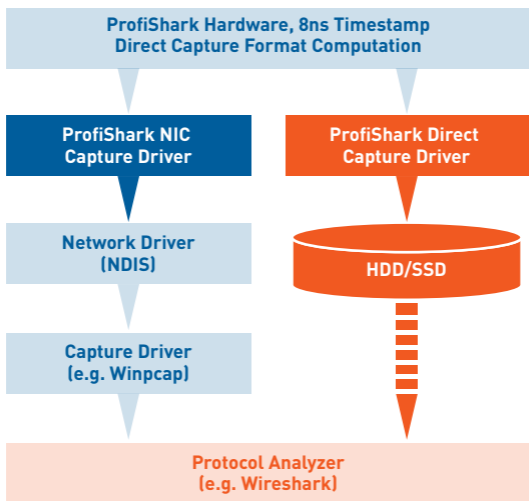


Live Capture vs Direct Capture

Two mode of capture are available: Live Capture mode, and Direct Capture mode.

In Live Capture mode, the capture is performed like on any other network card. The frames are routed to the NDIS driver.

In Direct Capture mode, the frame stream is dumped to the disk. The capture file format is computed in the ProfiShark hardware.



Live Capture Mode

ProfiShark 10G transmits network frames to the capture software without altering them. It is transparent for packet size, packet type, or protocols. All tags and encapsulation are preserved (e.g. VLAN, MPLS, GRE).

The screenshot shows the 'Features' tab of the ProfiShark 10G software. It is divided into three main sections:

- Status:** Displays device information on the left and capture statistics on the right.
 - Left side: ProfiShark 10G Connected, Driver Version : 0.1.3.18, SW Firmware Version : 0.2.3.8, HW Firmware Version : 0003, MAC Address : 00:1e:c0:fc:b0:87
 - Right side: Module Present / Module Present, Software Dropped Packets : 0, Hardware Dropped Packets : 0, Link Up Duration : -, Last Link Down Duration : -
- Firmware Update:** Contains a text input field, a 'Browse' button, and a 'Flash Firmware' button.
- Capture Format:** Contains several checkboxes:
 - Enable timestamps in live capture
 - Transmit CRC Errors
 - Keep CRC32
 - Disable Port A
 - Disable Port B
 - Packet SlicingThere are also 'Save' and 'Reset Device' buttons.

The “Software Dropped Packets” counter in the *Features* tab indicates the number of packets dropped by the driver in Live Capture mode. It is not representative of the packets dropped in Direct Capture (see “Direct Capture Mode” chapter). These drop events are caused by high CPU usage.

The “Hardware Dropped Packets” counter indicates the amount of captured packets that were dropped due to a high demand for USB bandwidth. Hardware filters and packet slicing can greatly reduce the amount of traffic to be captured, and thus prevent hardware packet drops.

NOTE Capture of small packet at high speed is extremely challenging for processors and can cause software drops. For that reason, another capture mode is available (see “Direct Capture Mode” chapter).

Timestamping

The hardware timestamping feature can be used in Live Capture mode, using Profitap's Wireshark dissector. The dissector files can be found on the provided USB flash drive, or in the Resource Center at: **www.profitap.com**

The dissector is compatible with Wireshark (x86 and x64) 1.12.x, 2.0.x, and 2.2.x.

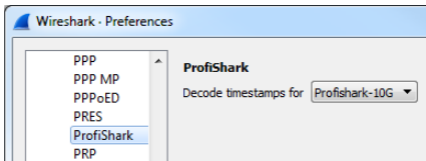
Linux: Copy the file (profishark.so) to '/usr/local/lib/wireshark/plugins/[wireshark_version]/', from x86 or x64 depending on the Linux version.

Windows:

Copy the file (profishark.dll) in the 'plugins/[wireshark_version]/' subfolder of your Wireshark installation folder, from x86 or x64 depending on the Windows version

The dissector can be enabled or disabled in the Wireshark preferences (Edit -> Preferences -> Protocols -> ProfiShark -> Decode timestamps for ProfiShark 10G).

The timestamp option must be enabled in the ProfiShark Manager's Features tab (see "Features" chapter).



If "Decode timestamps for ProfiShark 10G" is enabled, Wireshark assumes that every packet contains the ProfiShark timestamp.

If timestamps aren't displayed in nanosecond resolution in Wireshark, select 'Nanoseconds' in 'View -> Time Display Format'.

Additional information

Ordering reference

C1AP-10G

Connectors

2 x SFP+

1 x USB 3.0

1 x 5 VDC optional input

LEDs

4 x Link activity

1 x Power

System requirements

Dual Core Processor

4 GB memory

USB 3.0 port

Supported OS

Windows 10 32 & 64 bits

Windows 8 32 & 64 bits

Windows 7 32 & 64 bits

Linux

Dimensions (WxDxH)

105 x 124 x 26 mm

4.13 x 4.88 x 1,02 in

Weight

180 g / 0.62 lb

Operating temperature

0 to +50°C / 32 to 122°F

Storage temperature

-40 to +80°C / -40 to 176°F

Relative humidity

10 to 95%, non-condensing

Accessories

1.8m USB 3.0 cable

Pouch

USB key

Compliance

RoHS

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