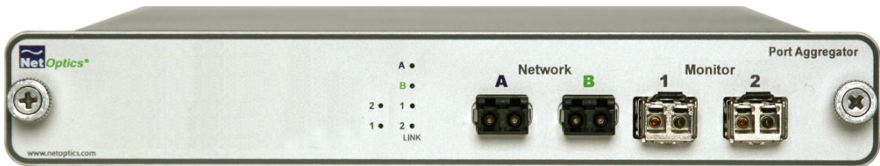




Installation Guide for GigaBit Fiber Port Aggregator Tap with SFP Monitor Ports



Contents

Introduction	1
Key Features	1
Unpacking and Inspection	3
Product Diagram	3
LED Indicators	3
Application Diagrams: Memory Operation	4
Connecting to the Network	6
Connecting the Monitoring Device	7
Changing the SFP Monitor Port Connector	8
Connecting Power	8
Specifications	9
Accessories	9
Limitation on Warranty and Liability	10

PLEASE READ THESE LEGAL NOTICES CAREFULLY.

By using a Net Optics Port Aggregator Tap you agree to the terms and conditions of usage set forth by Net Optics, Inc., the Tap manufacturer.

No licenses, express or implied, are granted with respect to any of the technology described in this manual. Net Optics retains all intellectual property rights associated with the technology described in this manual. This manual is intended to assist with installing Net Optics products into your network.

Trademarks and Copyrights

© 2007 by Net Optics, Inc. Net Optics® is a registered trademark of Net Optics, Inc. Additional company and product names may be trademarks or registered trademarks of the individual companies and are respectfully acknowledged.

Additional Information

Net Optics, Inc. reserves the right to make changes in specifications and other information contained in this document without prior notice. Every effort has been made to ensure that the information in this document is accurate.

Introduction

Net Optics GigaBit Port Aggregator Taps with SFP Monitor Ports provide ultra-efficient access to critical GigaBit links. This pioneering technology enables any two devices to simultaneously monitor a full-duplex link using only one NIC per monitoring device. Small Form Factor Pluggable (SFP) connectors on the Monitor Ports allow these Port Aggregators to also perform media conversion from fiber to copper.

Typically, full-duplex monitoring with a network tap requires two NICs (or a dual channel NIC) – one interface for each side of the tapped full-duplex connection. The Gigabit Port Aggregator Tap combines and regenerates these streams, sending all aggregated data out one or two passive monitoring ports. The best part of this innovation is the onboard memory that ensures traffic isn't dropped during bursts.

The GigaBit Port Aggregator Tap is designed to handle the combined traffic of a single full-duplex link. Normally, the traffic should be below the receiving capacity of the NIC, that is, less than 1 Gbps.

When the traffic queue exceeds the capacity of the NIC, the Tap buffers the overflow up to 1GB. The buffers clear automatically when the traffic volume falls below the receiving capacity of the NIC. For example, if there is a traffic burst and a Tap connected to a 1 Gbps network port on a monitoring device is now receiving 1.2 Gbps of traffic, the Tap buffers data until the burst is over. The Tap then sends the buffered data to the monitoring device until the buffer is cleared.

Key Features

Technology

- Supports full-duplex monitoring with a single NIC, increasing monitoring efficiency
- Regeneration Tap technology enables two devices to simultaneously monitor all aggregated traffic – using only one NIC per device
- 1GB of buffer memory prevents data loss during excessive traffic loads
- Provides complete full-duplex visibility at 1 Gbps without data stream interference or introducing a point of failure

- Passes all traffic (including errors) from all layers for comprehensive troubleshooting
- No IP address is needed for the Tap or monitoring device, enhancing monitoring security
- Redundant power ensures monitoring uptime
- Fully RoHS compliant

Ease of Use

- LED indicators show redundant power, speed, link, and activity status
- Front-mounted connectors support easy installation and operation
- Silk-screened application diagram illustrates all connections for easy deployment
- Optional 19-inch rack frames hold up to two Taps
- Small form-factor pluggable (SFP) monitor port connectors increase monitoring options
- Available with -48 VDC power
- Tested and compatible with all major manufacturers' monitoring devices, including protocol analyzers, probes, and intrusion detection/prevention systems

Support

- Net Optics offers free technical support throughout the lifetime of your purchase (and has done so since our start in 1996!). Our technical support team is available from 8 am to 5 pm Pacific Time, Monday through Friday at +1 (408) 737-7777 and via email at ts-support@netoptics.com. FAQs are also available on Net Optics website at www.netoptics.com.

Unpacking and Inspection

Carefully unpack the GigaBit Fiber Port Aggregator Tap and check for damaged or missing parts. The Port Aggregator Tap ships with the following:

- GigaBit Fiber Port Aggregator Tap with SFP Monitor Ports
- Two SC to SC fiber cables
- Two power supplies (AC power models)
- Installation Guide

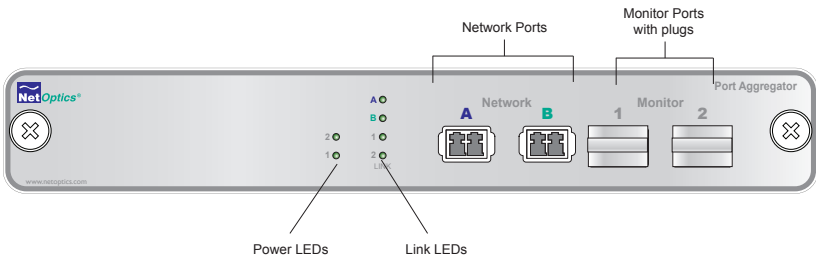
In addition to the Port Aggregator, you should have ordered one or two Giga-Bit SFP modules. You may have also ordered an extended warranty. Carefully check the packing slip against parts received. If any part is missing or damaged, contact Net Optics' Customer Service immediately.

About this Guide

This Guide provides you all the information you need to install and operate the GigaBit Fiber Port Aggregator Tap. Please read the entire Guide before attempting to install or operate the Tap.

This Guide covers the following models:

Part Number	Description
TPA-SX4-SFP	GigaBit Port Aggregator, multimode SX fiber, 60/40 split ratio, two SPF monitor ports
TPA-SX5-SFP	GigaBit Port Aggregator, multimode SX fiber, 50/50 split ratio, two SPF monitor ports
TPA-LX4-SFP	GigaBit Port Aggregator, singlemode LX fiber, 60/40 split ratio, two SPF monitor ports
TPA-LX5-SFP	GigaBit Port Aggregator, singlemode SX fiber, 50/50 split ratio, two SPF monitor ports
TPA-50SX5-SFP	GigaBit Port Aggregator, multimode 50um SX fiber, 50/50 split ratio, two SPF monitor ports



Product Diagram

Figure 4: Front Panel

LED Indicators

- PWR 1/ PWR 2:** Main and Redundant Power. If the Tap is deployed with both power supplies, both LEDs illuminate when the Tap is plugged in. If an LED is off, this indicates that the corresponding power supply is not functioning.
- Link/Activity Indicators:** If a good link is established, the LED illuminates a steady green. If there is current activity on this link, the LED flashes.

Application Diagrams: Memory Operation

All traffic that passes through the Tap is sent to the monitoring device NIC on a first-in, first-out basis, including traffic that is temporarily stored in memory. (If two packets enter at the same time then one packet is processed while the other is stored briefly in memory, preventing collisions.)

When there is a burst of data, traffic in excess of the NIC's capacity is sent to the Tap's memory. Up to 512 megabytes of data per side of the full-duplex stream can be stored in memory. Memory continues to fill until its capacity is reached, or the burst ends – whichever comes first.

In both cases, the Tap applies a first-in, first out procedure, processing stored data before new data from the link. If memory fills before the burst ends, the memory stays filled as the stored data is processed – data that leaves the buffer is immediately replaced. If the burst ends before the memory fills, memory clears until the full megabyte of capacity is available, or another until another burst in excess of the NIC's capacity requires additional memory.

The following three diagrams illustrate a simple example of a 1000 Mbps NIC moving from 80% utilization, to 140% utilization, then back to 80% utilization.

State 1: Side A + Side B is less than or equal to 100% of the NIC's receive capacity.

Example: On a 1000 Mbps link, Side A is at 300 Mbps and Side B is at 500 Mbps. The NIC receives 800 Mbps of traffic (80% utilization), so no memory is required for the monitoring device NIC to process all full-duplex traffic.

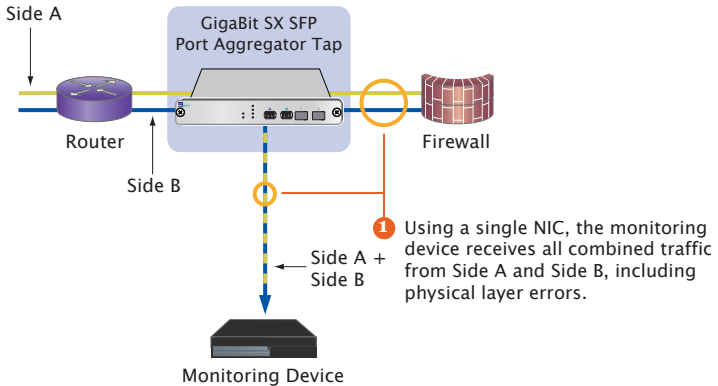


Figure 1: Aggregated traffic is less than NIC's capacity

State 2: Side A + Side B becomes greater than 100% of the NIC's receive capacity.

Example: There is a burst of traffic, so Side A is now at 900 Mbps while Side B remains at 500 Mbps. The NIC's utilization is at 140%, requiring the use of memory to help prevent data loss.

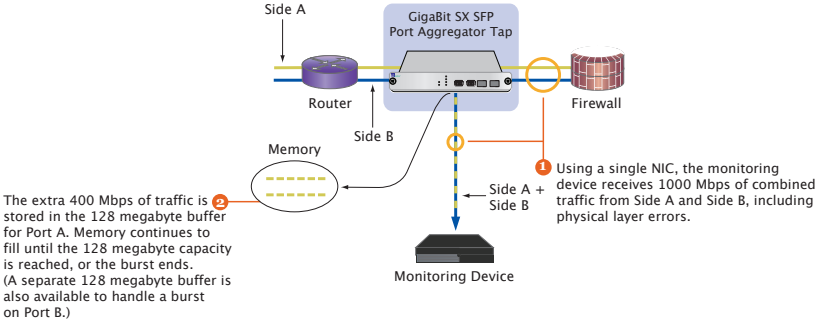


Figure 2: Aggregated traffic is greater than NIC's capacity

State 3: Side A + Side B is once again less than 100% of the NIC's receive capacity.

Example: On a 1000 Mbps link, Side A is again at 300 Mbps and Side B remains at 500 Mbps. The NIC's utilization is again at 80%.

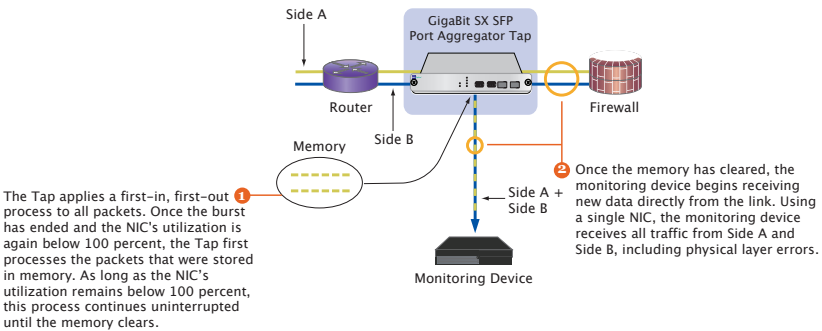


Figure 3: Traffic burst has passed

Connecting to the Network

Optical connections are extremely sensitive to contaminants. Make sure all optical surfaces are clean before connecting.

To connect to the Network Ports:

1. Remove protective plugs.
2. Connect Network Port A to the appropriate network device using a Duplex LC cable.
3. Connect Network Port B to the appropriate network device using a Duplex LC cable.
4. Verify that the Tap Network Ports are cabled in-line between two devices.

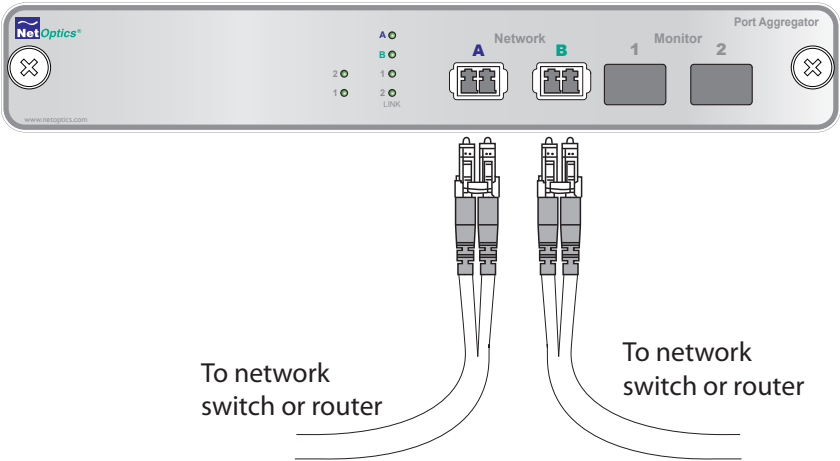


Figure 4: Connecting to the Network

Connecting the Monitoring Device

To protect the Port Aggregator Tap, the SFP slots are filled with temporary plugs. If you are installing only one SFP, leave the plug in Monitor Port 2 to protect the Port Aggregator Tap. You must install the SFP before connecting to the monitoring device.

To connect the Monitor Ports:

1. Remove the SFP from its protective packaging.
2. Remove the temporary plug from Monitor Port 1.
3. Insert the SFP in the Monitor 1 Port until you hear it click into place.
4. Connect Monitoring Port 1 to the appropriate port on the monitoring device using an RJ45 CAT5e cable to monitor the **A** and **B** links.
5. If you are installing two SFPs, repeat Steps 1 through 4 for Monitor Port 2.

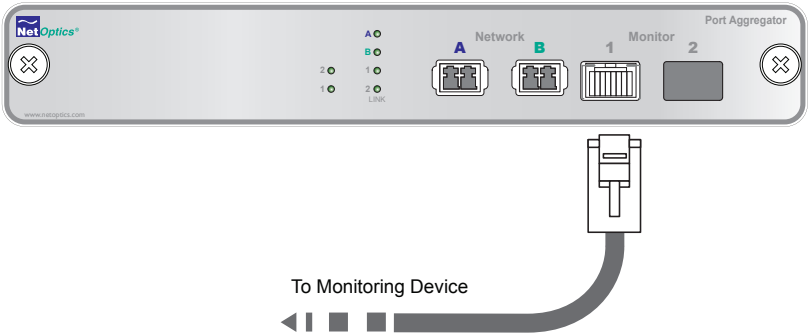


Figure 5: Connecting the Monitoring Device

Changing the SFP Monitor Port Connector

You have the option to change the interface on the Monitor Port by changing the small form-factor plug (SFP) on the Monitor Port. You can order conversion kits which include the singlemode fiber, multimode fiber, GigaBit copper SFP and appropriate cable from Net Optics. For ordering information, see Specifications on page 9.

To change the SFP:

1. Remove the cable from the SFP on the Port Aggregator Tap.
2. Lower the wire clip to release the SFP connector.
3. With the clip on the lowered position, pull gently on the clip to free the SFP.
4. Insert the new SFP until you hear it click into place.
5. Connect the cable supplied with the kit.

Connecting Power

The second power supply is available to support the flow of traffic to the monitoring device, in the event that the first power supply becomes unavailable. If the first power supply is unavailable, the second power supply will supply all power for the Tap. Even if no power is available to the passive Tap, network traffic flows uninterrupted.

1. Supply power to the Tap via the two power connectors on the rear of the unit. Two power supplies are included with the AC power models. The use of the second redundant power supply is optional.
2. Verify that the Power LEDs illuminate. PWR 1 illuminates when the first power supply is in use, and PWR 2 illuminates when the second power supply is in use. Both power supplies can be plugged into the Tap at the same time.

Specifications

Optical

SX Fiber Type: Corning Multimode 50/125 μ m or 62.5/125 μ m, wavelength 850nm

LX Fiber Type: Corning Multimode 8.5/125 μ m, wavelength 1310nm

Environment

Operating Temperature: 0°C to 55°C

Storage Temperature: -10°C to 70°C

Relative Humidity: 10% min, 95% max, non-condensing

Power

AC Power Input: 100-240 VAC, 0.5A, 47-63Hz

Output: 12V, 3A

DC Power Input: -48 VDC typical, -36 VDC min, -75 VDC max

Mechanical

Dimensions: 1.125" high x 11" deep x 8.75" wide

Connectors

(2) Duplex LC connectors (network ports)

(2) SFP ports for SFP modular connectors

Certifications

Fully RoHS compliant

Accessories

SFP Conversion Kits

SFPKT-SX Multimode fiber SFP with cable

SFPKT-LX Singlemode fiber SFP with cable

SFPKT-GCU GigaBit copper SFP with cable

Limitation on Warranty and Liability

Net Optics offers a limited warranty for all its products. IN NO EVENT SHALL NET OPTICS, INC. BE LIABLE FOR ANY DAMAGES INCURRED BY THE USE OF THE PRODUCTS (INCLUDING BOTH HARDWARE AND SOFTWARE) DESCRIBED IN THIS MANUAL, OR BY ANY DEFECT OR INACCURACY IN THIS MANUAL ITSELF. THIS INCLUDES BUT IS NOT LIMITED TO LOST PROFITS, LOST SAVINGS, AND ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT, even if Net Optics has been advised of the possibility of such damages. Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Net Optics, Inc. warrants this Tap to be in good working order for a period of ONE YEAR from the date of purchase from Net Optics or an authorized Net Optics reseller.

Should the unit fail anytime during the said ONE YEAR period, Net Optics will, at its discretion, repair or replace the product. This warranty is limited to defects in workmanship and materials and does not cover damage from accident, disaster, misuse, abuse or unauthorized modifications.

If you have a problem and require service, please call the number at the end of this section to speak with our technical service personnel. They may provide you with an RMA number, which must accompany any returned product. Return the product in its original shipping container (or equivalent) insured and with proof of purchase.

THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, EXPRESS OR IMPLIED. No Net Optics reseller, agent, or employee is authorized to make any modification, extension, or addition to this warranty.

Net Optics is always open to any comments or suggestions you may have about its products and/or this manual.

Send correspondence to
Net Optics, Inc.
5303 Betsy Ross Drive
Santa Clara, CA 95054 USA
Telephone: +1 (408) 737-7777
Fax: +1 (408) 745-7719
Email: info@netoptics.com/[Internet: www.netoptics.com](http://www.netoptics.com)

All Rights Reserved. Printed in the U.S.A. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form, by any means, without prior written consent of Net Optics, Inc., with the following exceptions: Any person is authorized to store documentation on a single computer for personal use only and that the documentation contains Net Optics' copyright notice.

www.neoptics.com