



Installation Guide for 10 GigaBit In-Line Regeneration Tap™



Contents

- Introduction 1
- Key Features 2
- About This Guide 3
- Unpacking and Inspection. 3
- Product Diagrams 4
- LED Indicators 5
- Installing the 10 GigaBit Regeneration Tap 5
- Connecting to the Network 6
- Connecting to Monitoring Devices Using Custom Monitoring Cable 7
- Connecting to Monitoring Devices Using Standard SC Fiber Cables 8
- Troubleshooting 10
- Specifications 11
- 10 GigaBit Ethernet Connection Distances 13
- Limitations on Warranty and Liability 14

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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 10 GigaBit Regeneration Taps solve the key physical layer challenges of multi-device monitoring for 10 GigaBit fiber networks. For a complete picture of network health, these Taps connect multiple network management and security devices at any single 10 GigaBit network location.

One Tap, No Idle Resources

Keep your intrusion detection and prevention systems, protocol analyzers, RMON probes, and other security devices productive with a single Regeneration Tap. Maximize resources and save on access points when multiple devices can monitor link traffic simultaneously through a single Regeneration Tap. Secure, passive access for multiple devices simply means a better return on monitoring investments.

Security and Visibility

Without an IP address, monitoring devices are isolated from the network, dramatically reducing their exposure to attacks. However, the monitoring device connected to the Tap still sees all full-duplex traffic as if it were in-line, including Layer 1 and Layer 2 errors.

Reliability

For extra uptime protection, Net Optics Taps offer redundant power connections. Should the primary power source fail, the Tap automatically switches to the backup power source. Power LEDs on the front of the Tap indicate the current power source.

Key Features

Passive Secure Technology

- Optimized and tested for 10 GigaBit fiber networks with 50 μ m fiber
- Enables real-time, simultaneous monitoring of a single 10 GigaBit link with multiple monitoring devices
- Provides complete full-duplex visibility at 10 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
- Connectors are perfectly angled to reduce cable strain
- Silk-screened application diagram illustrates all connections for easy deployment
- Optional custom monitoring cables support easy full-duplex monitoring by sending each side of the signal to a separate monitoring device NIC
- 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. 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.

About This Guide

Please read the guide before attempting to install 10 GigaBit Regeneration Tap. This guide covers the following models:

Part Number	Description
RGN-50SR-IL4	4x1 10 GigaBit Regeneration Tap SR
RGN-SR-IL8	8x1 10 GigaBit Regeneration Tap SR
RGN-LR-IL4	4x1 10 GigaBit Regeneration Tap LR
RGN-LR-IL8	8x1 10 GigaBit Regeneration Tap LR

Unpacking and Inspection

Unpack the 10 GigaBit Regeneration Tap and verify that you have all components by checking the Packing List against goods received.

The 10 GigaBit Regeneration Tap ships with the following:

- 2 power cables
- Fasteners for rack mounting
- 1 Installation Guide
- 1 Test Report

You may have also ordered Net Optics Custom Monitoring Cables and an Extended Warranty. If any part is missing or damaged, immediately contact Net Optics Customer Service at 1 408 737.7777.

Product Diagrams



Figure 1: Front Panel

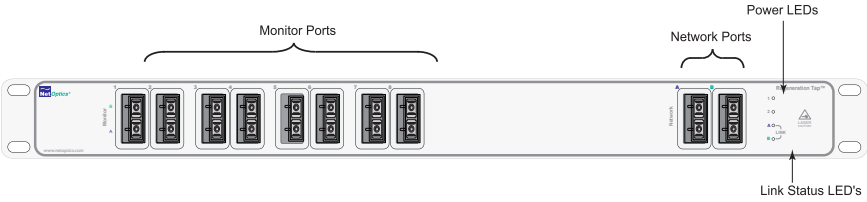



Figure 2: Front Panel

LED Indicators

Icon	Function	Description
	PWR 1 and 2	Illuminates blue when power is applied to the Tap
LINK	Port A and B	Illuminates blue when link is established with another devices connected to the port

Installing the 10 GigaBit Regeneration Tap

The Regeneration has two network connectors are labeled A and B. Depending on your Tap model, there are either four or eight connectors for monitor devices.

Warning: The intended use of this product is in systems that contain lasers. Use caution when handling unconnected fiber.

DANGER: Invisible Laser Radiation when open or when operating with fiber disconnected. **AVOID DIRECT EXPOSURE TO THE BEAM.** Never operate unit with a broken fiber or with a fiber connector disconnected.

CAUTION: There are no user serviceable parts inside. Refer all servicing to qualified Net Optics service personnel.

To mount and power the Regeneration Tap:

1. If you are rack mounting the Regeneration Tap, insert the Tap in an available one rack unit space and secure with the four fasteners included with the Tap.
2. Check that connector dust covers are in place.
3. Connect the redundant power connectors to separate power sources.
4. Secure the AC power cables with the connector clips.
5. Check the power LEDs to verify that the Tap is receiving power.

Connecting to the Network

1. Obtain the correct singlemode (LR) or multimode (SR) cables according to the model of your Regeneration Tap.
2. Connect Network Port A to the appropriate switch, server or router device using a duplex SC fiber cable.
3. Connect Network Port B to the appropriate switch, server or router device using a duplex SC fiber cable.
4. Verify that the Regeneration Tap Network Ports are cabled in-line between two devices by checking the Link Status LEDs.

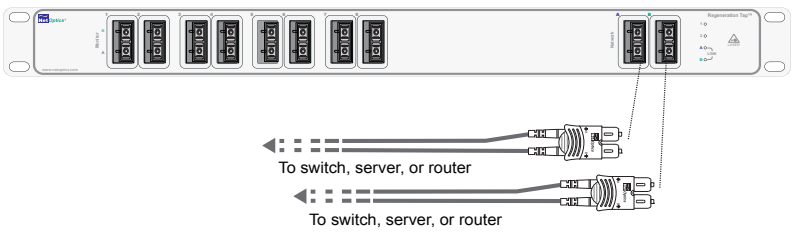


Figure 3: Connecting to Network Devices

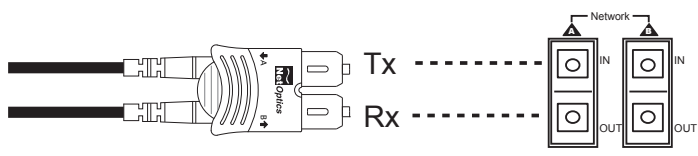


Figure 4: Network Cable Connection Detail

Connecting to Monitoring Devices Using Net Optics Custom Monitoring Cable

The Monitor Ports of the Regeneration Tap are transmit only. Connect the Monitor Ports to the receive side of two NICs on the monitoring device. Net Optics offers a custom “Y” cable with the correct connections for quick installation. The SC connectors on the Custom Monitor Cable contain Rx connections only. The Tx connectors do not have fiber and provide a safe cover for laser light.

To connect a Custom Monitoring Cable:

1. Using a Net Optics Custom Monitor Cable (see Figure 5), connect the single-duplex end to the Regeneration Tap Monitor Port A or B.
2. Connect the twin-duplex end of the cable labeled into the appropriate monitoring device port to monitor the link (see Figure 7).
3. Connect the other twin-duplex end to the appropriate monitoring device port to monitor the link.
4. Repeat steps 1-3 for each monitoring device you wish to connect to the Regeneration Tap.

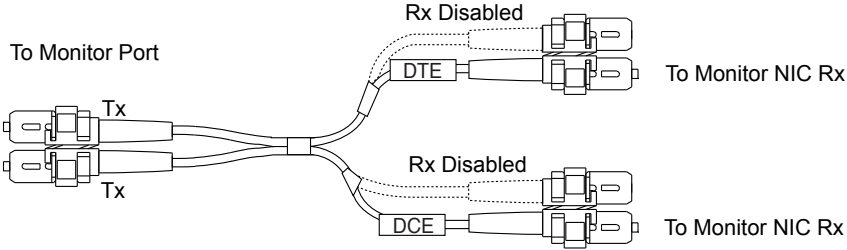


Figure 5: Net Optics Custom Monitor Cable

Connecting to Monitoring Devices Using Standard SC Fiber Cables

If you did not purchase a Net Optics Custom Monitoring Cable, you can easily modify a standard fiber cable by splitting apart the connector on one side of the cable (see Figure 6).

Warning: Uncovered connectors can emit dangerous laser light. Do not operate devices with uncovered connectors.

To connect a standard monitoring cable:

1. Prepare a standard SC cable by removing fiber strands from the connector clip so you have a cable similar to Figure 6.
2. Connect the double connector side of the cable to a Regeneration Tap Monitoring Port.
3. Connect one single end of the cable into the Rx connector of the monitoring device's NIC port to monitor the link.
4. Connect the other single end of the cable into a second Rx connector of the monitoring device's NIC to monitor the link.
5. Close the open Tx connectors on the monitoring devices' NICs with a suitable cover to prevent injury from laser light.
6. Repeat steps 1-5 for each monitoring device you wish to connect to the Regeneration Tap.

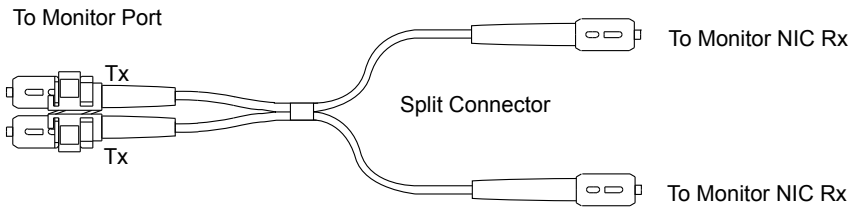


Figure 6: Splitting a Standard SC Cable

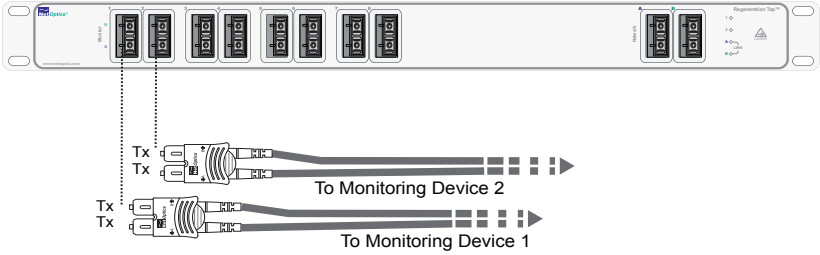


Figure 7: Connecting Monitoring Devices

Troubleshooting

Before contacting Net Optics Technical Support, perform the following checks.

Problem	Solution
Power LEDs do not illuminate	Check both power cord connections. Check both power sources for power.
Link Status LEDs do not illuminate	Check that you have connected the network devices correctly (see Figure 4, page 5). Verify that the TX and RX are not crossed on the network ports.
	Check that the connectors are clean and firmly seated.
	Verify that you are connected to 10 GigaBit transceivers.
Traffic is passing through the Tap but not through the Monitor Ports	Check that you have connected the network devices correctly (see Figure 4, page 5). Verify that the TX and RX are not crossed on the network ports.
	Check that the connectors are clean and firmly seated.
	Verify that you are connected to 10 GigaBit transceivers.
Communications are intermittent	Check that the connectors are clean and firmly seated.
	Check insertion loss calculations.
	Check that you are using the correct fiber cable type (see page 12).
	Replace cables with cables known to be good.

If these checks fail to correct the problem, note the unit's serial number before calling Net Optics for assistance and be prepared to describe the installation scenario and the problem you are experiencing.

Specifications

Environment

Operating Temperature: 0°C to 55°C

Storage Temperature: -10°C to 70°C

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

Power

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

Mechanical

Dimensions: 1.75" high x 10.5" deep x 19" wide

Certifications

Fully RoHS compliant

Optical Interface

Transceivers: Class I, eye-safe, laser emitter type. These Class I Lasers conform to the applicable requirements per US 21 CFR (J) and EN 60825-1, also UL 1950 applications.

Split Ratio: 50/50

Multimode (SR):

Cable Type: Multimode Corning 50/125 μ m, wavelength 850nm

Insertion Loss: Network Port: \leq 4.5 dB

Monitor Port: \leq 4.5 dB

Optical Transmitter Wave Length: 850 nm nominal

Output Power: -9.5 dB min, -4.0 dB max

Optical Receiver Input Sensitivity: 0.0 dB min, -17.0 dB max

Singlemode (LR):

Cable Type: Singlemode Corning 8.5/125 μ m, wavelength 1310/1550nm

Insertion Loss: Network Port: \leq 3.7 dB

Monitor Port: \leq 3.7 dB

Optical Transmitter Wave Length: 1310 nm nominal

Output Power: -10.0 dB min, -3.0 dB max

Optical Receiver Input Sensitivity: -3.0 dB min, -20.0 dB max

Connectors

RGN-SR-IL-4 and RGN-50SR-IL-4 model:

- (4) Duplex SC Multimode connectors (monitor ports)
- (2) Duplex SC Multimode connectors (network ports)

RGN-SR-IL-8 model:

- (8) Duplex SC Multimode connectors (monitor ports)
- (2) Duplex SC Multimode connectors (network ports)

RGN-LR-IL-4 model:

- (4) Duplex SC Singlemode connectors (monitor ports)
- (2) Duplex SC Singlemode connectors (network ports)

RGN-LR-IL-8 model:

- (8) Duplex SC Singlemode connectors (monitor ports)
- (2) Duplex SC Singlemode connectors (network ports)

10 GigaBit Ethernet Connection Distances

10GB-SR (850 nm laser)

Fiber Core Diameter	Type	Fiber Bandwidth Mhz/km	Distance
62.5 μm	Multimode	160 Mhz/km	26 m
62.5 μm	Multimode	200 Mhz/km	33 m
50.0 μm	Multimode	400 Mhz/km	66 m
50.0 μm	Multimode	500 Mhz/km	83 m
50.0 μm	Multimode	2007 Mhz/km	300 m

10GB-LR (1310 nm laser)

Fiber Core Diameter	Type	Fiber Bandwidth Mhz/km	Distance
8.5 μm	Singlemode	n/a	up to 10 Km

10GB-ER (1550 nm laser)

Fiber Core Diameter	Type	Fiber Bandwidth Mhz/km	Distance
8.5 μm	Singlemode	n/a	up to 30 Km

Limitations 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 Regeneration 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 listed at the end of this section and 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.

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