



## CHAPTER 6

# Cabling the Line Ports and Completing the Installation

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## Introduction

This chapter provides instructions for cabling the Gigabit Ethernet ports and for configuring Gigabit Ethernet (GBE) interface parameters.



### Note

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When installing an External Optical Bypass module, the SCE 1000 line ports are connected to the module. See the External Optical Bypass Module for complete instructions.

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- [Connecting the Line Ports to the Network, page 6-2](#)
- [How to Load and Activate a Service Control Application, page 6-8](#)

# Connecting the Line Ports to the Network

This module explains the procedures for cabling the line ports, configuring the interface parameters, and testing connectivity of the links.

- [Cabling Diagrams, page 6-2](#)
- [How to Configure Gigabit Ethernet Auto-Negotiation, page 6-4](#)
- [Connecting the GBE Line Interface Ports, page 6-4](#)
- [Testing Connectivity: Examining Link LEDs and Counters, page 6-6](#)
- [What to Do Next, page 6-7](#)

## Cabling Diagrams

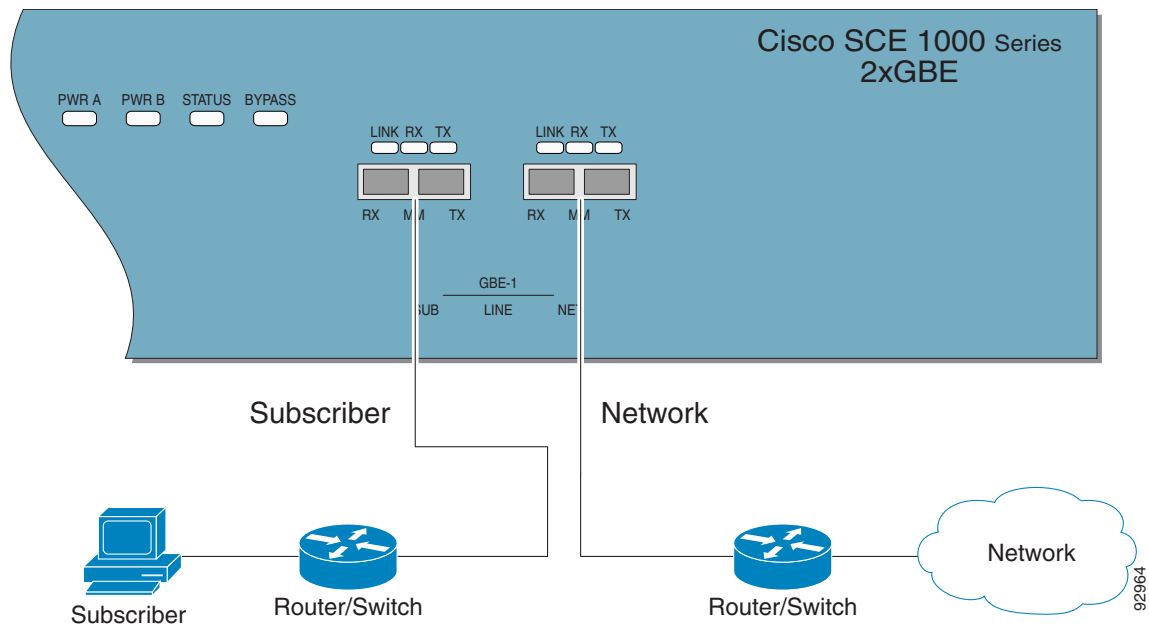
Before beginning, find the appropriate cabling diagram for the topology in your installation:

- [Single Link: Inline Topology, page 6-2](#)
- [Single Link: Receive-only Topology, page 6-3](#)

### Single Link: Inline Topology

In the inline topology ([Figure 6-1](#)), the SCE 1000 resides physically on the GBE (Gigabit Ethernet) link between the subscribers, which are usually connected through either a BRAS (in DSL access), a PDSN (in wireless access), a CMTS (in the Cable access), or a switch or router aggregator (in other topologies), and the network, where the SCE 1000 usually connects to a router or layer 3 switch network element.

**Figure 6-1** *Single Link: Inline Topology*



In the inline or bump-in-the-wire topology, illustrated in the diagram above, the SCE 1000 resides physically on the data link between the subscriber side, usually either a BRAS (in DSL access), a PDSN (in wireless access), a CMTS (in the Cable access), or a switch or router aggregator (in other topologies), and the network side, usually a router or layer 3 switch network element. This is the inline topology, providing both traffic monitoring and control capabilities.

In this topology, all the traffic of the SCE 1000 is deployed as a transparent layer2 overlay on the customer's existing network.

## Single Link: Receive-only Topology

In this topology (Figure 6-2), an external optical splitter resides physically on the GBE link between the subscriber side and the network side. The external splitter is connected to the SCE 1000 via Rx links only.

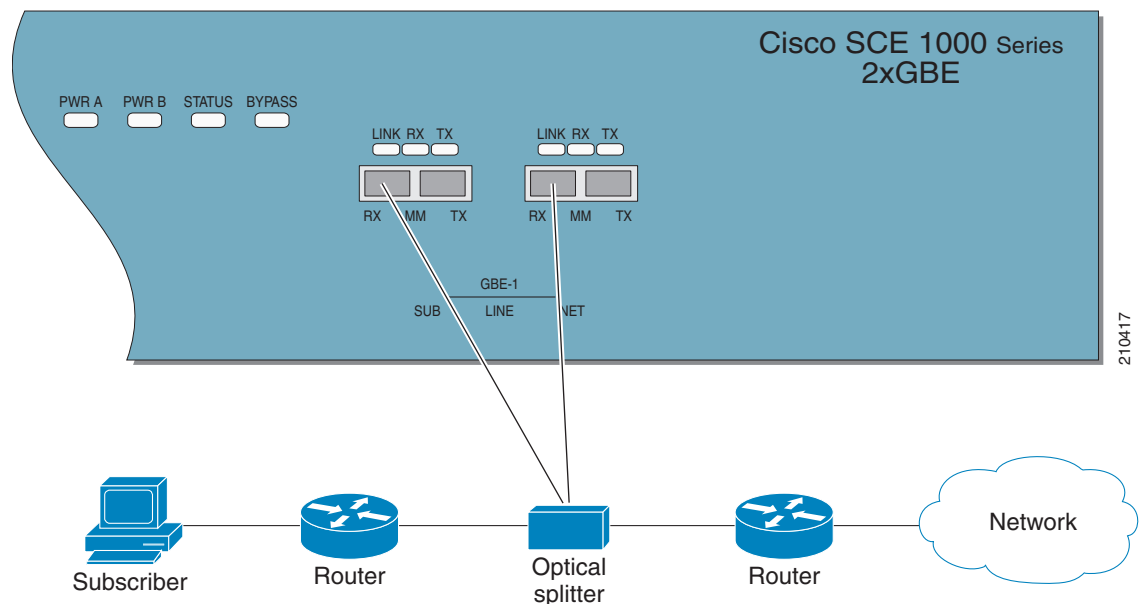
In this topology, the traffic passes through the external splitter, which splits traffic to the SCE 1000. The SCE 1000, therefore, is in receive-only topology, having only traffic monitoring capabilities.



### Note

Receive-only topologies can also be implemented using a switch. Such a switch must support SPAN functionality that includes separation between ingress and egress traffic and multiple SPAN-ports destinations.

**Figure 6-2** Single Link: Receive-only Topology



## How to Configure Gigabit Ethernet Auto-Negotiation

By default, the SCE 1000 GBE line interface ports are configured with auto-negotiation disabled.


**Note**

Auto-negotiation must be disabled when the SCE 1000 is deployed via an external optical splitter (receive-only topology)


**Note**

If you change any parameters, you must save the new configuration settings. Type copy running-config startup-config, and press Enter.

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- Step 1** At the SCE 1000# prompt, type configure and press Enter.  
Enters Global Configuration Mode.
- Step 2** At the SCE 1000(config)# prompt, type interface Gigabit Ethernet 0/ port number, and press Enter.  
Enters the Gigabit Ethernet Interface configuration mode for the specified GBE port.  
Port number is the number of the selected port (1 or 2).
- Step 3** At the SCE 1000(config if)# prompt, type auto-negotiate and press Enter.  
Enables auto-negotiation for the GBE interface.
- Step 4** At the SCE 1000(config if)# prompt, type exit and press Enter.  
Returns to Global Configuration Mode, from which you can enter the Gigabit Ethernet Interface configuration mode for the remaining GBE port.  
Repeat this procedure to configure auto-negotiation for the other GBE port interface.
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## Connecting the GBE Line Interface Ports

The following sections present the general procedure for cabling the GBE interface ports. Refer to [Cabling Diagrams, page 6-2](#) to find the appropriate cabling diagram for the topology of your system for the specific connections required.


**Note**

When installing an External Optical Bypass module, the SCE 1000 line ports are connected to the module. See External Optical Bypass Module for complete instructions.

- [Fiber Specifications, page 6-5](#)
- [How to Cable the GBE Port, page 6-5](#)

## Fiber Specifications

Table 6-1 presents the fiber specifications. The SCE 1000 may be ordered with either Multimode or Single Mode transceivers. The transceiver type is indicated on the front panel under the ports. Note that both transceivers on any individual SCE 1000 are the same, either 850nm Multimode or 1310nm Single Mode.

**Table 6-1** Fiber Specifications

SCE Model	Transceiver	Transmit Power	Receive Power	Typical (Max.) Distance
SCE 1000 2xGBE MM	850nm Multimode	SCE 1000 2xGBE MM 850nm Multimode -9.5 to -4 dBm	-17 to 0 dBm	<ul style="list-style-type: none"> <li>750m for 50µm Core Diameter MMF</li> <li>400m for 62.5µm Core Diameter MMF</li> </ul>
SCE 1000 2xGBE SM	1310nm FRP laser Single Mode	-9.5 to -3 dBm	-20 to 3 dBm	10 km for 9.0µm Core Diameter SMF

## How to Cable the GBE Port



### Note

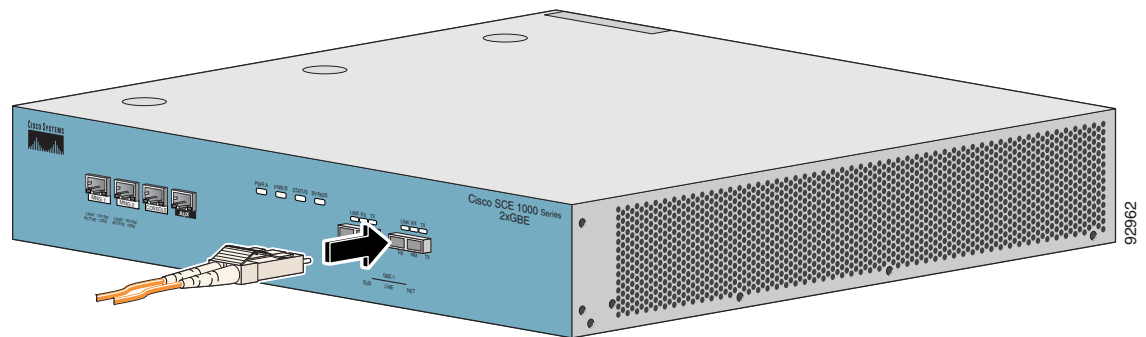
Class 1 laser. Avoid exposure to radiation and do not stare into open aperture.

### Step 1

Take the appropriate fiber optic cable (see [Fiber Specifications, page 6-5](#)) and plug it into the appropriate GBE port on the front panel of the SCE 1000 ([Figure 6-3](#)).

Make sure to push on the connector until you hear a click, which indicates that the connector is fully inserted and secured in the receptacle. Always make sure that you insert the connector completely into the socket.

**Figure 6-3** Cabling the GBE Port



**Step 2** Verify that the link LED is green.

If the link LED does not light, try removing the network cable plug and reinserting it firmly into the module socket.

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## Testing Connectivity: Examining Link LEDs and Counters

If the SCE 1000 platform has been powered up, test now to verify that connectivity has been established on all links. If the SCE 1000 platform is not powered up, perform this step after starting the SCE 1000 platform.

- [Examining the LEDs, page 6-6](#)
- [Viewing the Counters to See that the Network Traffic is Reaching the Device, page 6-6](#)
- [How to View the Gigabit Ethernet Counters, page 6-7](#)

### Examining the LEDs

The GBE Link LED must be green to verify that an active connection exists.

The GBE Rx and Tx LEDs (if flashing green) indicate that traffic is being received or transmitted by the SCE 1000 platform, respectively.

Note that in an inline topology, the Rx and Tx LEDs indicate that packets are being received/transmitted by the SCE 1000 platform.

In optical splitter topologies, the Rx LEDs are the sole indicators. The Tx LEDs do not “blink”, since the Tx is not connected to the port in this topology.

### Viewing the Counters to See that the Network Traffic is Reaching the Device

In inline topology, you can monitor traffic via the platform counters for both the Rx and Tx connections. The counters increase, together with the increased number of packets that flow through the SCE 1000 for both Rx and Tx.

However, in receive-only topologies, the counters for the Tx do not increment, that is, Tx does not have a function in monitoring traffic, as it is disconnected.

### How to View the Gigabit Ethernet Port Status

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**Step 1** At the SCE 1000# prompt, type **show interfaceGigabitEthernet 0/ interface-number**.

This displays the port link and auto-negotiation status.

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The following example displays a system response.

**EXAMPLE:**

```
SCE 1000numbershow interface Gigabit Ethernet 0/1Auto negotiation configured: Enabled
Actual Status:
Link is on, Auto negotiation: Enabled,
Bandwidth: 100000Kbps,
Burst-size: 50000bytes
```

Again, auto-negotiation for bump-in-the-wire topology may be enabled or disabled. For receive-only topologies, using an external splitter, auto-negotiation must be disabled.

## How to View the Gigabit Ethernet Counters

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**Step 1** Type **show interface GigabitEthernet 0/interface counters**.

This displays the Gigabit Ethernet counters. This command enables you to verify that traffic is taking place. You can see that the counters increase, together with the increased number of packets that flow through the SCE 1000.

Again, in bump-in-the-wire topology, both the Rx and Tx counters are relevant as traffic monitors. For receive-only topologies, using an external switch, only the Rx counters are relevant.

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The following example shows the counters of the first Gigabit Ethernet interface:

```
SCE 1000numbershow interface GigabitEthernet 0/1 countersIn total octets: 100
In good unicast packets: 90
In good multicast packets: 0
In good broadcast packets: 10
In packets discarded: 0
In packets with CRC/Alignment error: 0
In undersized packets: 0
In oversized packets: 0
Out total octets: 93*2^32+1022342538
Out unicast packets: 858086051
Out non unicast packets: 0
Out packets discarded: 0
```

## What to Do Next

You are now ready to continue to the next stage, [How to Load and Activate a Service Control Application](#), page 6-8.

## How to Load and Activate a Service Control Application

The SCE 1000 platform provides the basic functionality of Service Control analysis and enforcement. A Service Control solution requires that a Service Control application be loaded into the platform, to take advantage of the unique SCE platform capabilities.

Loading and activating an application includes the following stages:

- Downloading the application provided as an SLI file to the SCE 1000 disk.
- Activating the application.
- Configuring the application.

The detailed procedure of how to perform these operations is not specified and described in this manual. For further details, refer to the following documentation:

- [\*Cisco Service Control Application for Broadband User Guide\*](#)
- [\*Cisco Service Control Application for Broadband Reference Guide\*](#)