

# Gigabit eco-friendly Ethernet Switches

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**AT-GS900/16**  
**AT-GS900/24**

## Installation Guide

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# Electrical Safety and Emissions Standards

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This product meets the following standards.

## U.S. Federal Communications Commission

### Radiated Energy

Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Modifications or changes not expressly approved of by the manufacturer or the FCC, can void your right to operate this equipment.

## Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

## European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment

This Allied Telesis RoHS-compliant product conforms to the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment. Allied Telesis ensures RoHS conformance by requiring supplier Declarations of Conformity, monitoring incoming materials, and maintaining manufacturing process controls.

RFI Emissions    FCC Class A  
                         CISPR 22 Class A  
                         EN55022 Class A: 2006+A1:2007 version


**Warning:** In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Immunity            EN55024

Electrical Safety    UL – USA (UL60950-1)  
                         LVD (EN60950-1, 2nd edition)  
                         CSA or cUL – Canada  
                         C-Tick – Australia  
                         CE Mark

## Translated Safety Statements

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**Important:** The  indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” on the Allied Telesis website at <http://www.alliedtelesis.com/support>.

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# Preface

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This guide contains instructions on how to install the AT-GS900/16 and AT-GS900/24 Gigabit Ethernet Switches. This preface contains the following sections:



- “Safety Symbols Used in this Document” on page 12
- “Contacting Allied Telesis” on page 13

## Safety Symbols Used in this Document

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This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
	Warning	Performing or omitting a specific action may result in electrical shock.

## Contacting Allied Telesis

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If you need assistance with this product, you may contact Allied Telesis technical support by going to the Support & Services section of the Allied Telesis web site at **[www.alliedtelesis.com/support](http://www.alliedtelesis.com/support)**. You can find links for the following services on this page:

- ❑ 24/7 Online Support - Enter our interactive support center to search for answers to your questions in our knowledge database, check support tickets, learn about RMAs, and contact Allied Telesis technical experts.
- ❑ USA and EMEA phone support - Select the phone number that best fits your location and customer type.
- ❑ Hardware warranty information - Learn about Allied Telesis warranties and register your product online.
- ❑ Replacement Services - Submit a Return Merchandise Authorization (RMA) request via our interactive support center.
- ❑ Documentation - View the most recent installation guides, user guides, software release notes, white papers and data sheets for your product.
- ❑ Software Updates - Download the latest software releases for your product.

For sales or corporate contact information, go to **[www.alliedtelesis.com/purchase](http://www.alliedtelesis.com/purchase)** and select your region.

## Chapter 1

# Product Description

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The AT-GS900/16 and AT-GS900/24 switches are low operating power, unmanaged, Layer 2 Fanless Gigabit Ethernet switches designed to simplify the task of creating or expanding an Ethernet, Fast Ethernet, or Gigabit Ethernet network.

This chapter contains the follows sections:

- ❑ “Features” on page 15
- ❑ “Components” on page 16
- ❑ “Hardware Feature Description” on page 17
- ❑ “Ethernet Switching Basics” on page 21

## Features

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AT-GS900/16 and AT-GS900/24 Gigabit eco-friendly Ethernet switches features include:

- ❑ Silent fanless operation
- ❑ Power saving port features on each port including:
  - Cable Length detection and power minimization
  - Link-Down power savings
- ❑ LED disable mode
- ❑ 16 or 24 x 10/100/1000Mbps auto-sensing, switching ports
- ❑ MAC address table:
  - AT-GS900/16: Up to 8K MAC address table
  - AT-GS900/24: Up to 16K MAC address table
- ❑ Packet Buffer
  - AT-GS900/16: 2 Mb
  - AT-GS900/24: 3.5 Mb
- ❑ Back pressure for half-duplex operation
- ❑ IEEE 802.3x flow control for full duplex operation
- ❑ Support for Jumbo Frames up to 9216 Bytes
- ❑ Wire speed performance
- ❑ Non-blocking architecture
- ❑ Auto-negotiation Gigabit ports
- ❑ Auto MDI/MDI-X
- ❑ Transparent to VLAN tagged packets
- ❑ Rack Mount Brackets able to turn 90 degrees for Wall mount
- ❑ 1U chassis high
- ❑ Internal power supply

# Components

Figure 1 illustrates the front panels of the AT-GS900/16 and AT-GS900/24 switches.

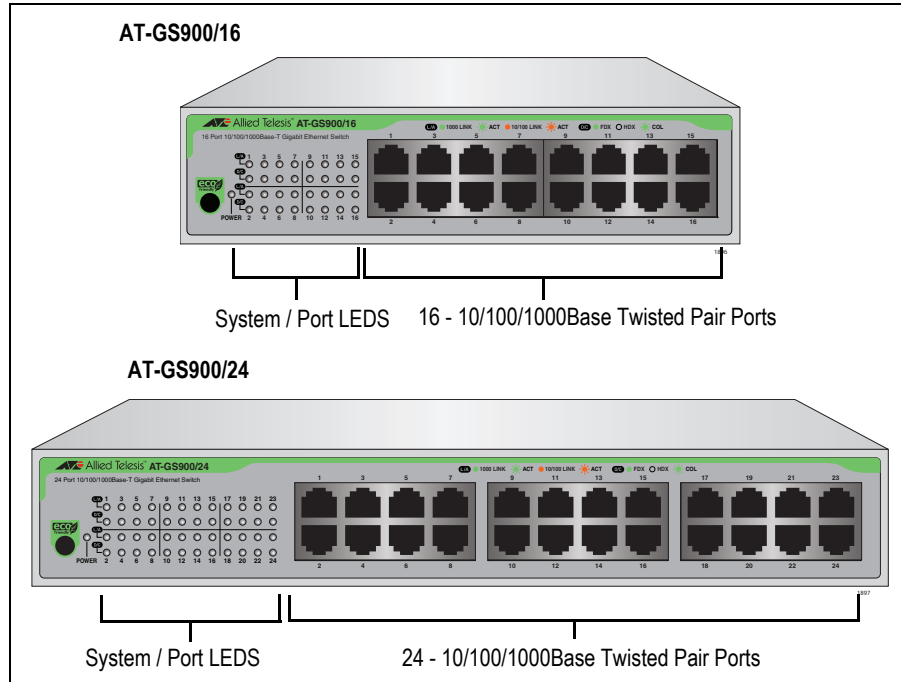


Figure 1. Front Panels

Figure 2 illustrates the back panels of the AT-GS900/16 and AT-GS900/24 switches.

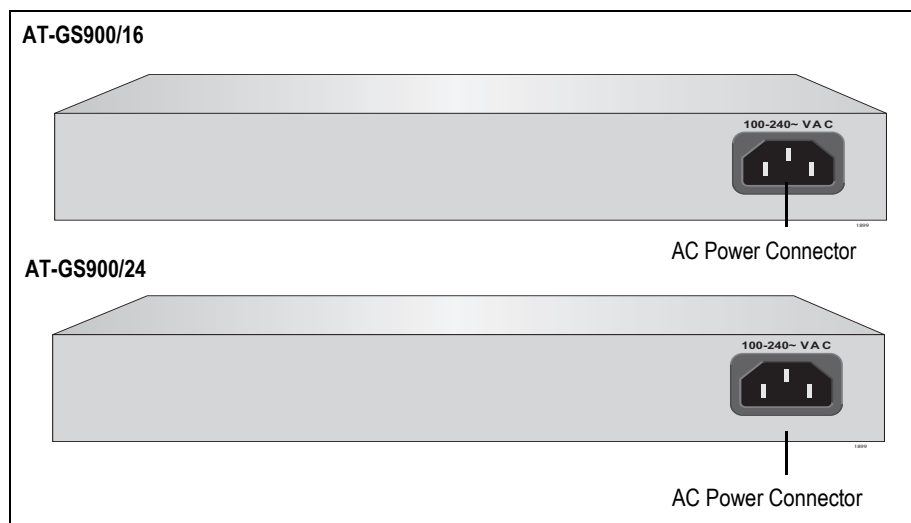


Figure 2. Back Panels



## Hardware Feature Description

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The following sections describe hardware features of the AT-GS900/16 and AT-GS900/24 Fanless Gigabit Ethernet switches:

- ❑ System and Port LEDs
- ❑ Twisted Pair Ports
- ❑ AC Power Connector

### Twisted Pair Ports

The AT-GS900/16 Fanless Gigabit Ethernet switch features 16 twisted pair ports, and the AT-GS900/24 Fanless Gigabit Ethernet switch features 24 twisted pair ports.

#### Type of Connector

The twisted pair ports feature 8-pin RJ-45 connectors. (For the port pinouts, refer to “RJ-45 Twisted Pair Port Connectors” on page 42.)

#### Speed

Each port is 10/100/1000Base-T compliant and is capable of 10, 100, or 1000 Mbps speed, respectively. The ports are IEEE 802.3u Auto-Negotiation compliant. With Auto-Negotiation, the switch automatically matches the highest possible common speed between each switch port and each end-node. For example, if an end-node is capable of only 10 Mbps, the switch sets the port connected to the end-node to 10 Mbps.

#### Duplex Mode

Each twisted pair port on the switch can operate in either half- or full duplex mode. The twisted pair ports are IEEE 802.3u-compliant and will Auto-Negotiate the duplex mode setting.

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#### Note

For the switch to set the duplex mode for each port correctly, the end-nodes that you connect to the switch ports should also use Auto-Negotiation. Otherwise, a duplex mode mismatch can occur, affecting network performance. For further information, refer to “Duplex Mode” on page 21.

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### **Maximum Distance**

Each twisted pair port has a maximum operating distance of 100 m (328 feet).

### **Type of Cabling**

For 10 Mbps operation, Category 3 or better 100 ohm shielded or unshielded twisted pair cabling is required. For 100 or 1000 Mbps operation, Category 5 and Enhanced Category 5 (5E) 100 ohm shielded or unshielded twisted pair cabling is required.

### **Auto MDI/MDI-X**

All of the ports on the switch are auto-MDI and IEEE 802.3ab-compatible. Since each port's speed and duplex mode are set through Auto-Negotiation, the port uses the auto-MDI feature to automatically configure itself as MDI or MDI-X when connected to an end-node. Consequently, you can use either a straight-through or crossover twisted pair cable when connecting any network device to a port.

### **Green Power Saving Ports**

All Ethernet ports support the power saving functions including Link-Down and Cable Length power savings. The greatest power savings occur when all 8 ports' linked status is down and the ports are inactive. The switch uses the most power when all 8 ports are linked up to via Ethernet cables that are the maximum length or 100 meters.

When a link is not established on an individual port, the switch controller automatically reduces the power supplied to the port's circuitry to an idle level. The greater the number of ports that are not linked up results in a greater cumulative power savings for the switch.

When a link is established on an individual port, the power provided to the PHY circuitry is based on the length of the Ethernet cable that you connect to the port. Full power is provided to the port's circuitry if the cable length is detected to be the maximum specified cable length or 100 m. If the cable length is shorter than this, the switch senses the cable length and reduces the available port power in proportion to the detected cable length. This feature provides power efficiencies for the port even when it is actively linked to another network device.

**eco-friendly Switch**

The eco-friendly switch on the front panel is multi-functional and shown in Figure 3. It may be used to enable all the port LEDs (out position) or conserve power by turning off the port LEDs (in position). The switch functions are described in Table 2.



Figure 3. eco-friendly Switch

Table 2. eco-friendly Switch Functions

Action	Results
OFF (Out position)	All front panel LEDs are enabled.
ON (In position)	All front panel LEDs are disabled for power conservation with the exception of the POWER LED, which remains active at all times.

**LEDs** The system and port LEDs on the front panel of the AT-GS900/16 and AT-GS900/24 switches display the switch and its port status information. See Figure 4. Each port has two LEDs.

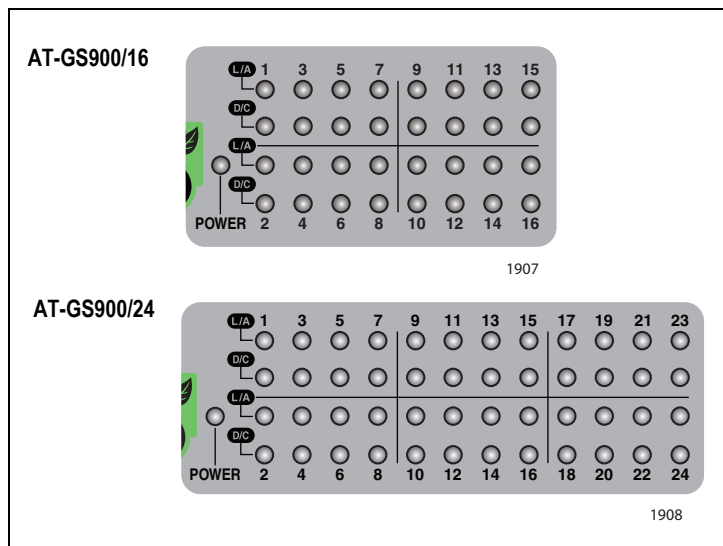


Figure 4. Port LEDs

Table 3 describes the system and port LEDs on the AT-GS900/16 and AT-GS900/24 switches.

Table 3. System and Port LEDs

LED	State	Description
POWER	Green	The switch is powered ON and operating normally.
	OFF	The switch has no power.
L/A	Solid Green	A valid 1000 Mbps link is established on the port.
	Solid Orange	A valid 10 or 100 Mbps link is established on the port.
	Blinking Green	A 1000 Mbps packet transmission and reception is in process on the port.
	Blinking Orange	A 10/100 Mbps packet transmission and reception is in process on the port.
	OFF	No link is established on the port.
D/C	Solid Green	A full-duplex link is established on the port.
	Blinking Green	The port is experiencing a collision in half duplex mode.
	OFF	A half-duplex link is established on the port.

**AC Power Connector**

Both the AT-GS900/16 and AT-GS900/24 switches have a single AC power supply socket on the back panel. To power ON or OFF the switch, you connect or disconnect the power cord.

See Figure 2 on page 16 for an illustration of the back panels. For the input voltage range, refer to Appendix A, "Power Specifications" on page 40.

## Ethernet Switching Basics

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An Ethernet switch interconnects network devices, such as workstations, printers, routers, and other Ethernet switches, so that they can communicate with each other by sending and receiving Ethernet frames.

### **MAC Address Table**

Every hardware device on your network has a unique MAC address. This address is assigned to the device by the device's manufacturer. For example, when you install a Network Interface Card (NIC) in a computer so that you can connect it to the network, the NIC already has a MAC address assigned to it by its manufacturer.

The AT-GS900/16 can store up to 8000 MAC addresses in its MAC address table and the AT-GS900/24 can store up to 16,000 entries. Each switch uses the table to store the MAC addresses of the network end-nodes connected to the ports, along with the port number on which each address was learned.

A switch learns the MAC addresses of the end-nodes by examining the source address of each packet received on a port. It adds the address and port on which the packet was received to the MAC table (if the address has not already been entered in the table). The result is a table that contains all the MAC addresses of the devices that are connected to the switch's ports, and the port number where each address was learned.

When the switch receives a packet, it also examines the destination address and, by referring to its MAC address table, determines the port on which the destination end-node is connected. It then forwards the packet to the appropriate port and to the end-node. This increases network bandwidth by limiting each frame to the appropriate port where the intended end-node is located, freeing the other switch ports for receiving and transmitting data.

If the switch receives a packet with a destination address that is not in the MAC address table, it floods the packet to all the ports on the switch. When the destination end-node responds, the switch adds its MAC address and port number to the table.

If the switch receives a packet with a destination address that is on the same port on which the packet was received, it discards the packet without forwarding it on to any port. Since both the source end-node and the destination end-node for the packet are located on the same port on the switch, there is no reason for the switch to forward the packet.

### **Duplex Mode**

Duplex mode refers to how an end-node receives and transmits data. If an end-node can either receive or transmit data, but not both simultaneously,

the end-node is operating in what is referred to as half-duplex mode. If an end-node can both receive and transmit data simultaneously, the end-node is said to be operating in full-duplex mode. Naturally, an end-node capable of operating in full-duplex can handle data much faster than an end-node that can only operate in half-duplex mode.

The twisted pair ports on the AT-GS900/16 and AT-GS900/24 switches can operate in half- or full-duplex mode for 10/100 Mbps and full-duplex for 1000 Mbps. They are IEEE 802.3u-compliant and use Auto-Negotiation to set the duplex mode setting for you automatically.

### **Store and Forward**

Both the AT-GS900/16 and AT-GS900/24 switches use store and forward as the method for receiving and transmitting frames. When a Ethernet frame is received on a switch port, the switch does not retransmit the frame from the destination port until it has received the entire frame and stored the frame in a port buffer. It then examines the frame to determine if it is a valid frame. Invalid frames, such as fragments or runts, are discarded by the switch. This process insures that only valid frames are transmitted from the switch ports and that damaged frames are not propagated on your network.

### **Backpressure and Flow Control**

To maintain the orderly movement of data between the end-nodes, an Ethernet switch may periodically need to signal an end-node to stop sending data. This can occur under several circumstances. For example, if two end-nodes are operating at different speeds, the switch, while transferring data between the end-nodes, might need to instruct the faster end-node to stop transmitting data to allow the slower end-node to catch up. An example of this would be when a server operating at 1000 Mbps is sending data to a workstation operating at only 100 Mbps.

How a switch signals an end-node to stop transmitting data differs depending on the duplex mode of the end-node and switch port. A twisted pair port operating in half-duplex mode stops an end-node from transmitting data by forcing a collision. A collision on an Ethernet network occurs when two end-nodes attempt to transmit data using the same data link at the same time. A collision causes an end-node to stop sending data, wait for a brief period of time, and then retransmit the same data. Once the switch is ready to receive data again, the switch stops forcing collisions. This is referred to as backpressure.

A port operating in full-duplex mode uses PAUSE frames, as specified in the IEEE 802.3x standard, to stop the transmission of data from an end-node. Whenever the switch wants an end-node to stop transmitting data, it issues this frame. The frame instructs the end-node to cease transmission for a period of time specified within the frame. The switch continues to issue PAUSE frames until it is ready again to receive data from the end-node. This is referred to as flow control.



## Chapter 2

# Installation

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This chapter contains the following sections:

- “Reviewing Safety Precautions” on page 25
- “Selecting a Site for the Switch” on page 27
- “Planning the Installation” on page 28
- “Unpacking the Switch” on page 29
- “Installing the Switch on a Table or Desktop” on page 30
- “Installing the Switch on a Wall” on page 32
- “Installing the Switch in a Rack” on page 35




## Reviewing Safety Precautions

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Please review the following safety precautions before you begin to install the chassis or any of its components.

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### Note


The  indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” on the Allied Telesis website at <http://www.alliedtelesis.com/support>.

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### Warning


To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the cables.  E1

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### Warning


Do not work on equipment or cables during periods of lightning activity.  E2

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### Warning


Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord.  E3

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### Warning

Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts.  E4

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### Note


Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible.  E5

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### Caution

Air vents must not be blocked and must have free access to the room ambient air for cooling.  E6

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**Warning**

Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C. *↪* E7

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**Note**

All Countries: Install product in accordance with local and National Electrical Codes. *↪* E8

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**Warning**

Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading. *↪* E25

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**Warning**

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips). *↪* E37

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**Note**

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T<sub>mra</sub>). *↪* E35

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**Caution**

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. *↪* E36

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**Caution**

The unit does not contain serviceable components. Please return damaged units for servicing. *↪* E42

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## Selecting a Site for the Switch

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Observe the following requirements when choosing a site for your switch:

- ❑ If you plan to install the switch in an equipment rack, ensure that the rack is safely secured and that it will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.
- ❑ If you are installing the switch on a table, ensure that the table is level and secure.
- ❑ The power outlet for the switch should be located near the unit and should be easily accessible.
- ❑ The site should provide for easy access to the ports on the front of the switch. This will make it easy for you to connect and disconnect cables, as well as view the switch's LEDs.
- ❑ To allow proper cooling of the switch, air flow around the unit and through its vents on the side and rear should not be restricted.
- ❑ Do not place objects on top of the switch.
- ❑ Do not expose the switch to moisture or water.
- ❑ Ensure that the site is a dust-free environment.
- ❑ You should use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.

## Planning the Installation

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Table 4 contains the cabling specifications for the twisted pair ports.

Table 4. Twisted Pair Cabling and Distances

Speed	Type of Cable	Maximum Operating Distance
10 Mbps	Category 3 or better 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)
100 Mbps	Category 5 or Category 5E (Enhanced) 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)
1000 Mbps	Category 5 and Category 5E (Enhanced) 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)

---

**Note**

The twisted pair ports on the switch feature Auto-MDI when operating at either 10, 100, or 1000 Mbps. Each port is individually configured as MDI or MDI-X when connected to an end-node. Consequently, you can use either a straight-through or crossover twisted pair cable when connecting any network device to a twisted pair port on the switch. For example, a port operating at 10 or 100 Mbps uses two pairs of twisted pair wiring while a port operating at 1000 Mbps uses four pairs of twisted pair wiring.

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## Unpacking the Switch

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To unpack an AT-GS900/16 or an AT-GS900/24 switch, perform the following procedure:

1. Remove all components from the shipping package.

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**Note**

Store the packaging material in a safe location. You must use the original shipping material if you need to return the unit to Allied Telesis.

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2. Place the switch on a level, secure surface.
3. Ensure the following hardware components are included in your switch package. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.
  - One AT-GS900/16 or AT-GS900/24 Fanless Gigabit Ethernet switch
  - Two rack/wall mounting brackets
  - Eight flathead Phillips screws for mounting brackets to the switch
  - Four T3.5\*16 screws and anchors for attaching the switch to the wall
  - Four screws for attaching the switch to the rack
  - Four self-adhesive rubber feet
  - AC power cord

## Installing the Switch on a Table or Desktop

To install the switch on a table or desktop, perform the following procedure:

1. Remove all the items from the packaging and store the packaging material in a safe place. In the event a problem occurs and you need to return the unit, please use as much of the original shipping material as possible.
2. Attach the four self-adhesive rubber feet to the bottom of the switch, as shown in Figure 5.

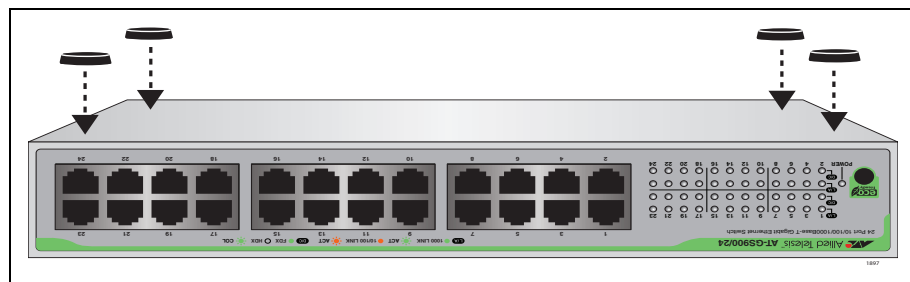


Figure 5. Attaching the Rubber Feet

3. Place the switch on a flat and secure surface, leaving ample space around the switch for ventilation.
4. Connected the twisted pair cables to the twisted pair ports.

When connecting a twisted pair cable to a port, observe the following guidelines:

- An RJ-45 connector should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.
- Check that you are using the appropriate type of twisted pair cabling. Refer to “Twisted Pair Cabling and Distances” on page 28 for twisted pair cable specifications.
- Since the twisted pair port, when operating in Auto-Negotiation, is Auto MDI/MDI-X, you can use either a straight-through or crossover twisted pair cable to connect any type of network device to a port on the switch. If you disable Auto-Negotiation on the port, the port defaults to MDI-X.

5. Apply AC power to the switch by plugging the power cord into the AC power connector on the back panel of the unit, as illustrated in Figure 6.

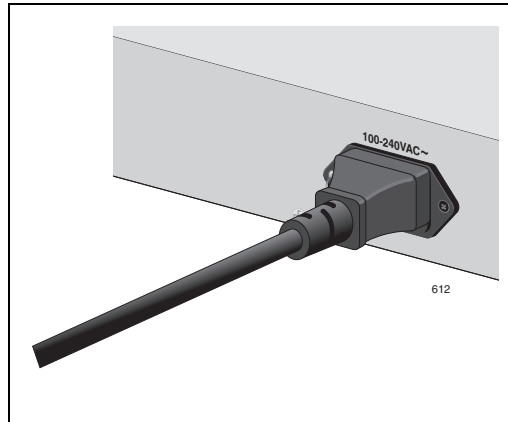


Figure 6. Connecting the AC Power Connector to Switch

6. Plug the other end of the power cord into a wall outlet.
7. Verify that the POWER LED is green. If the LED is OFF, refer to “Troubleshooting” on page 39 for instructions.

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**Note**

The switch performs a self-diagnostic test upon power up. This takes about 20 seconds to complete.

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8. Power ON the end-nodes connected to the switch.
9. Check that the L/A LEDs are green or blinking green for the ports connected to end-nodes. If any of the LEDs are OFF, refer to “Troubleshooting” on page 39 for instructions.

The switch is now ready for use.

## Installing the Switch on a Wall

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To install the switch on a wall, perform the following procedure:

1. Remove all the items from the packaging and store the packaging material in a safe place. In the event a problem occurs and you need to return the unit, please use as much of the original shipping material as possible.
2. Attach the two mounting brackets (provided) to the sides of the switch using the eight flathead Phillips screws (provided), as illustrated in Figure 7.

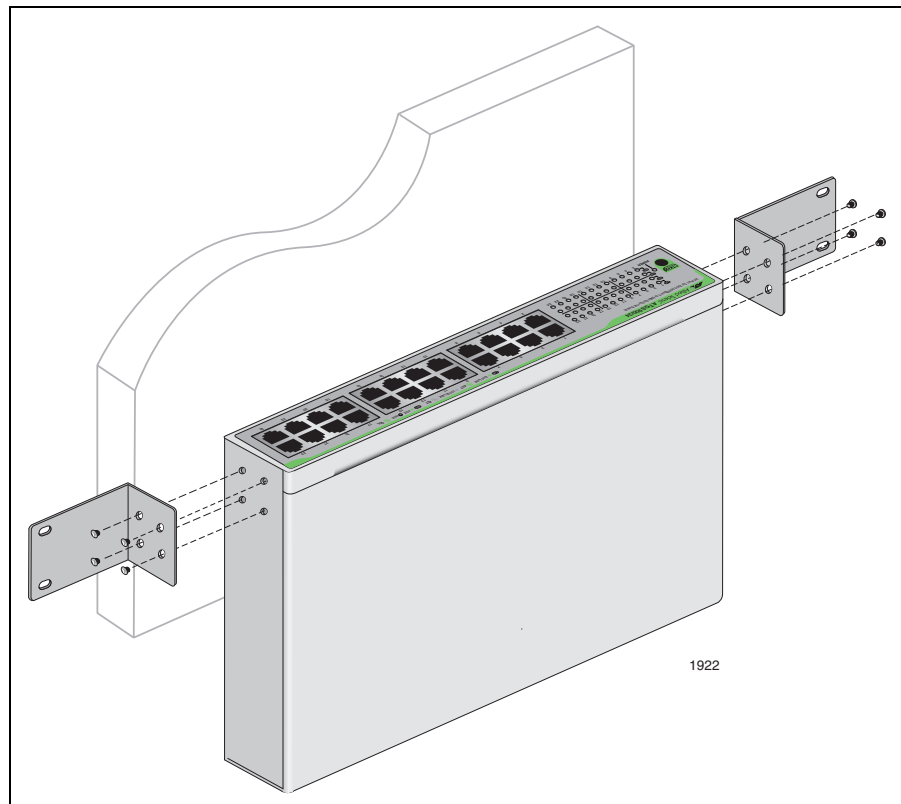


Figure 7. Attaching the brackets to the sides of the switch



3. Place the switch on the wall. Then mount the switch using the plastic anchors and T3.5\*16 screws which are shipped with the product. See Figure 8.

**Warning**

The switch must be mounted with the AC Power Connector facing down to conform with UL requirements as shown in Figure 8.

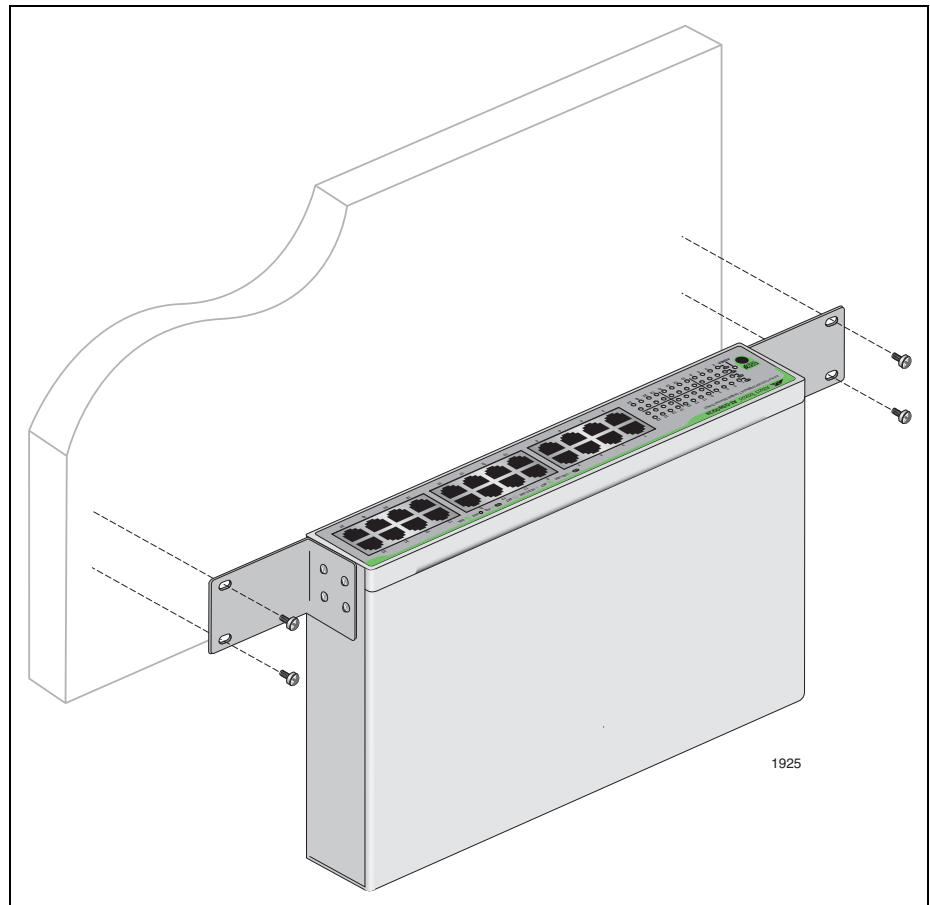


Figure 8. Attaching the switch to the wall

4. Connected the twisted pair cables to the twisted pair ports.

When connecting a twisted pair cable to a port, observe the following guidelines:

- An RJ-45 connector should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.
- Check that you are using the appropriate type of twisted pair cabling. Refer to “Twisted Pair Cabling and Distances” on page 28 for twisted pair cable specifications.
- Since the twisted pair port, when operating in Auto-Negotiation, is

Auto MDI/MDI-X, you can use either a straight-through or crossover twisted pair cable to connect any type of network device to a port on the switch. If you disable Auto-Negotiation on the port, the port defaults to MDI-X.

5. Apply AC power to the switch by plugging the power cord into the AC power connector on the back panel of the unit, as illustrated in Figure 6 on page 31.
6. Plug the other end of the power cord into a wall outlet.
7. Verify that the POWER LED is green. If the LED is OFF, refer to “Troubleshooting” on page 39 for instructions.

---

**Note**

The switch performs a self-diagnostic test upon power up. This takes about 20 seconds to complete.

---

8. Power ON the end-nodes connected to the switch.
9. Check that all the L/A LEDs are green or blinking green for the ports connected to end-nodes. If any of the LEDs are OFF, refer to “Troubleshooting” on page 39 for instructions.

The switch is now ready for use.

## Installing the Switch in a Rack

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Perform the following procedure to install the switch in a standard 19-inch rack. If you are not installing the switch in a rack, go to the next procedure.

1. Place the unit upside down on a level, secure surface.
2. If they have been previously installed, remove the self-adhesive rubber feet from the bottom of the switch, as shown in Figure 9 using a flat-head screwdriver.

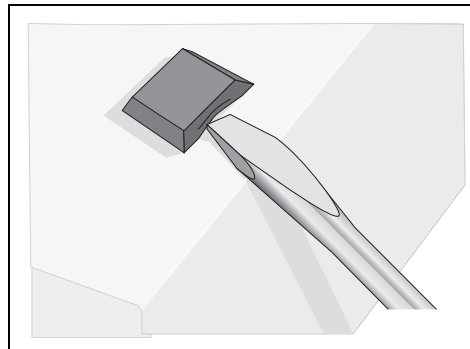


Figure 9. Removing the Feet

3. Turn the switch over.
4. Attach the two rackmounting brackets (provided) to the sides of the switch using the eight flathead Phillips screws (provided), as illustrated in Figure 10.

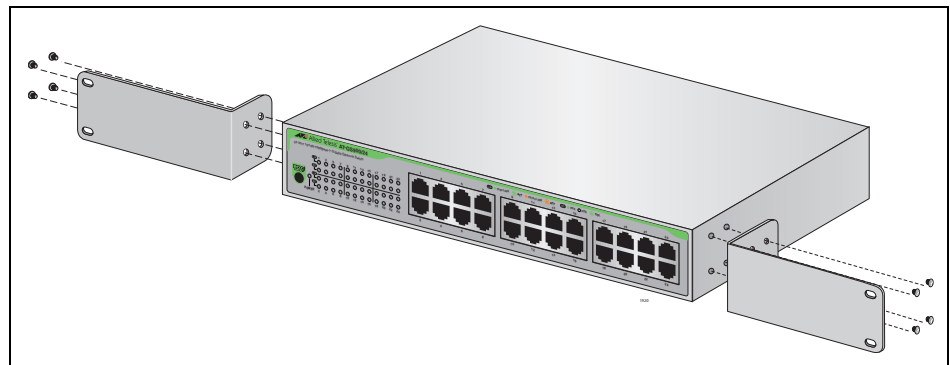


Figure 10. Attaching Rack Mounting Brackets

5. Mount the switch in the 19-inch rack using the #10-32 Phillips screws which are shipped with the product, as illustrated in Figure 11.

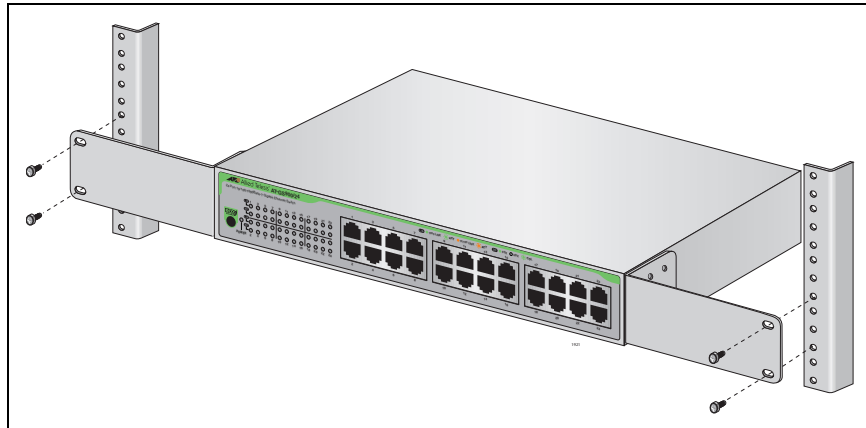


Figure 11. Rack Mounting the Switch

6. Connected the twisted pair cables to the twisted pair ports.

When connecting a twisted pair cable to a port, observe the following guidelines:

- An RJ-45 connector should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.
  - Check that you are using the appropriate type of twisted pair cabling. Refer to “Twisted Pair Cabling and Distances” on page 28 for twisted pair cable specifications.
  - Since the twisted pair port, when operating in Auto-Negotiation, is Auto MDI/MDI-X, you can use either a straight-through or crossover twisted pair cable to connect any type of network device to a port on the switch. If you disable Auto-Negotiation on the port, the port defaults to MDI-X.
7. Apply AC power to the switch by plugging the power cord into the AC power connector on the back panel of the unit, as illustrated in Figure 6 on page 31.
  8. Plug the other end or the power cord into a wall outlet.
  9. Verify that either the POWER LED is green. If the LED is OFF, refer to “Troubleshooting” on page 39 for instructions.

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**Note**

The switch perform a self-diagnostic test upon power up. This takes about 20 seconds to complete.

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10. Power ON the end-nodes connected to the switch.
11. Check that all the L/A LEDs are green or blinking green for the ports connected to end-nodes. If any of the LEDs are OFF, refer to “Troubleshooting” on page 39 for instructions.

The switch is now ready for use.



## Chapter 3

# Troubleshooting

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This chapter contains information on how to troubleshoot the switch in the event that a problem occurs.

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**Note**

If you are still unable to resolve the problem after following the instructions in this chapter, contact ATI Technical Support for assistance. Refer to “Contacting Allied Telesis” on page 13.

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Check the POWER LED on the front of the switch. If the LED is OFF, indicating that the unit is not receiving power, do the following:

- Ensure that the power cord is securely connected to the power source and to the AC connector on the back panel of the switch.
- Verify that the power outlet has power by connecting another device to it.
- Connect the unit to another power source.
- Use a different power cord.
- Verify that the voltage from the power source is within the required levels for your region.

Verify that the L/A LEDs are green or blinking green for each port is ON. If a L/A LED is OFF, do the following:

- Verify that the end-node connected to the port is powered ON and is operating properly.
- Verify that the twisted pair cable is securely connected to the port on the switch and to the port on the end-node.
- Ensure that the twisted pair cable does not exceed 100 meters (328 feet).
- Verify that you are using the appropriate category of twisted pair cable: Category 3 or better for 10 Mbps operation and Category 5 and Category 5E for 100 and 1000 Mbps operation.
- Verify that the eco friendly switch is in the “Out” position.

---

**Note**

A 1000Base connection can take from five to ten seconds for the link to be established.

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## Appendix A

# Technical Specifications

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## Physical Specifications

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Dimensions:	(W x D x H)
AT-GS900/16	12.1 cm x 18.4 cm x 4.4 cm (4.7 in x 7.2 in x 1.7 in)
AT-GS900/24	28 cm x 18 cm x 4.4 cm (11.0 in x 7.1 in x 1.7 in)
Weight:	
AT-GS900/16	0.954kg (2.1 lbs)
AT-GS900/24	1.794 kg (3.95lbs)

## Environmental Specifications

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Operating Temperature:	0° C to 40° C (32° F to 104° F)
Storage Temperature:	-25° C to 70° C (-13° F to 158° F)
Operating Humidity:	5% to 90% non-condensing
Storage Humidity:	5% to 95% non-condensing
Operating Altitude Range:	Up to 6,562 feet (2000 meters)

## Power Specifications

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Power Consumption:	
AT-GS900/16	9.9 watts maximum
AT-GS900/24	14.1 watts maximum
AC Input Electrical Ratings:	
AT-GS900/16	100 - 240 V AC, 0.5 A
AT-GS900/24	100 - 240 V AC, 1.2 A
Frequency:	50/60 Hz



## Safety and Electromagnetic Emissions Certifications

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EMI	FCC Part 15 Class A CISPR 22 Class A, EN55022 Class A: 2006 + A1:2007 version
Immunity	EN55024
Safety	UL - USA (UL60950-1) LVD (EN60950-1, 2nd edition) CSA or cUL - Canada C-Tick - Australia CD Mark
Environment Compliance	Eu-RoHS compliant WEEE China RoHS compliant
Quality and Reliability:	AT-GS900/16 MTBF: >50,000 hours @ 25 C AT-GS900/24 MTBF: >50,000 hours @ 25 C

## Compliance Standards

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IEEE 802.3 – 10Base-T

IEEE 802.3u – 100Base-TX

IEEE 802.3ab – 1000Base-TX Gigabit Ethernet

IEEE 802.3x – Flow Control, Symmetric and Asymmetric

## RJ-45 Twisted Pair Port Connectors

This section lists the connectors and connector pinouts for the AT-GS900/16 and AT-GS900/24 Fanless Gigabit Ethernet Switches and their components.

Figure 12 illustrates the pin layout to an RJ-45 connector and port.

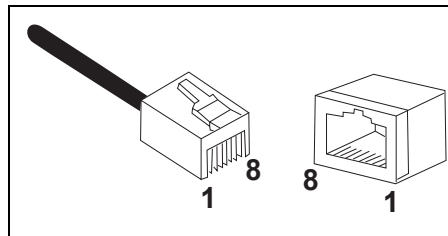


Figure 12. RJ-45 Connector and Port Pin Layout

Table 5 lists the RJ-45 pin signals when a twisted pair port is operating in the MDI configuration.

Table 5. MDI Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Table 6 lists the RJ-45 port pin signals when a twisted pair port is operating in the MDI-X configuration.

Table 6. MDI-X Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	RX+
2	RX-
3	TX+
6	TX-

Table 7 lists the RJ-45 connector pins and their signals when a 1000Base-T port is operating at 1000 Mbps.

Table 7. RJ-45 1000Base-T Connector Pinouts<sup>a</sup>

<b>Pin</b>	<b>Pair</b>	<b>Signal</b>
1	1	TX and RX+
2	1	TX and RX-
3	2	TX and RX+
4	3	TX and RX+
5	3	TX and RX-
6	2	TX and RX-
7	4	TX and RX+
8	4	TX and RX-

a. Bi-directional data on each pair.