IE340 Series

Industrial Ethernet Layer 3 Switches

IE340-12GP
IE340-12GT
IE340-20GP
IE340L-18GP

Installation Guide

613-002725 Rev. H

Electrical Safety and Emissions Standards

This section contains the following:

- “US Federal Communications Commission”
- “Industry Canada”
- “VCCI Statement”
- “Grounding and Bonding Requirements”
- “Regulatory Approvals” on page 4

US 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

Radiated Energy

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.

VCCI Statement

この装置は、クラスA情報処理装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。
VCCI-A

Grounding and Bonding Requirements

Electrical systems and communication cabling system that are required to be grounded must be connected to earth. Grounding and bonding provide reliable means to safely conduct voltages generated by lightning, line surges, or unintentional contact with high voltages lines or equipment to ground.

The users of the plant or those responsible for the installation shall institute the necessary measures (e.g., shielding, bonding, and grounding protection) to assure all components are on the ground fault path. Inappropriate grounding and bonding shall render all warranties null and void.

Regulatory Approvals

Compliance mark

CE, FCC, ICES, RCM, UL, UL-EU, VCCI

Safety

AS/NZS 62368-1
Audio/video information and communication technology equipment -
Part 1: Safety requirements
(Australian/New Zealand Standards)

CAN/CSA C22.2 NO. 60950-22
Information technology equipment -
Safety - Part 22: Equipment to be installed outdoors
(Canadian Standards Association)

CAN/CSA C22.2 NO. 61010-1-12[1]
Safety requirements for electrical equipment for measurement, control, and laboratory use:
Part 1: General requirements
(Canadian Standards Association)

CAN/CSA C22.2 NO. 61010-2-201[1]
Safety requirements for electrical equipment for measurement, control, and laboratory use:
Part 2-201: Particular requirements for control equipment
(Canadian Standards Association)

CAN/CSA C22.2 NO 62368-1
Audio/video information and communication technology equipment:
Part 1: Safety requirements
(Canadian Standards Association)

1. Not applicable to the IE340L-18GP switch.

EN/IEC/UL 61010-1[1]
Safety requirements for electrical equipment for measurement, control, and laboratory use:
Part 1: General requirements

EN/IEC/UL 61010-1-102[1]
Safety requirements for electrical equipment for measurement, control, and laboratory use:
Part 2-012: Particular requirements for climatic and environmental testing and other temperature conditioning equipment

EN/IEC/UL 62368-1
Audio/video information and communication technology equipment -
Part 1: Safety requirements: Information technology equipment - Safety - Part 22: Equipment to be installed outdoors (previously EN/IEC/UL 60950-22)

Electromagnetic Immunity

EN 55035
Electromagnetic compatibility of multimedia equipment - Immunity requirements

EN 61000-6-2
Electromagnetic compatibility - Part 6-2: Generic standards - Immunity standard for Industrial Environments

IEC CISPR 35
Electromagnetic compatibility of multimedia equipment - Immunity requirements

Electromagnetic Emission

AS/NZS CISPR 32
Electromagnetic compatibility of multimedia equipment - Emission requirements
(Australian/New Zealand Standard)

ICES 003 issue 6, class A
Information Technology Equipment (including Digital Apparatus) - Limits and Methods of Measurement
(Canadian Standard)

EN 55032
Electromagnetic compatibility of multimedia equipment. Emission requirements.

EN/IEC 61000-6-4
Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.

FCC 47 CFR Part 15 subpart B
Unintentional Radiators
(US Code of Federal Regulation)

IEC CISPR 11
Industrial, scientific, and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

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1. Not applicable to the IE340L-18GP switch.

IEC CISPR 32
Electromagnetic compatibility of multimedia equipment. Emission requirements.

Other Approvals

EN/IEC 50121-4
Railway Applications - Electromagnetic Compatibility - Part 4: Emissions and immunity of the signalling and telecommunications appartus

IEC 61131-2
Industrial - Process measurement requirements and control - Part 2: Equipment requirements and tests

IEC 61326-1
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

NEMA TS2
Traffic Controller Assemblies with NTCIP Requirements (Pending)

Note
Refer to “Electromagnetic and Environmental Test Types” on page 134 in Appendix A, “Technical Specifications” on page 127 for further information.

Warning
In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. E84

Allied Telesis Approved SFP Transceivers

EN 60825-1
Safety of laser products - Part 1: Equipment classification and requirements

EN 60825-2
Safety of laser products - Part 2: Safety ofoptical fiber communications systems

EN/IEC/UL 62368-1
Safety of laser products - Part 2: Safety ofoptical fiber communications systems

FDA/CDRH REGISTRATION
Registration of Laser Products with the FDA (CDRH)
(US requirement)

Warning
Laser Safety, EN 60825

Contents

Figures

Tables

Preface

This guide contains the hardware installation instructions for the IE340 Series of Industrial Ethernet Layer 3 switches. The switch models included in this manual are:

- IE340-12GP
- IE340-12GT
- IE340-20GP
- IE340L-18GP

The preface contains the following sections:

- "Safety Symbols Used in this Document" on page 16
- "Translated Safety Statements" on page 17

Safety Symbols Used in this Document

This document uses the following conventions.

Note
Notes provide additional information.

Caution
Cautions inform you that performing or omitting a specific action may result in equipment damage or loss of data.

Warning
Warnings inform you that performing or omitting a specific action may result in bodily injury.

Warning
Laser warnings inform you that an eye or skin hazard exists due to the presence of a Class 1 laser device.

Warning
Warnings inform you of hot surfaces.

Translated Safety Statements

Important: The ✍ indicates that translations of the safety statement are available in the PDF document **Translated Safety Statements** posted on the Allied Telesis website at **alliedtelesis.com/library/search**.

- Übersetzte Sicherheitserklärungen

  Wichtig: Das ✍ zeigt an, dass Übersetzungen der Sicherheitserklärung in den PDF-**Translated Safety Statements** auf der Allied Telesis-Website unter **alliedtelesis.com/us/en/library/search** verfügbar sind.

- Declaraciones de seguridad traducidas

  Importante: El ✍ indica que las traducciones de la declaración de seguridad están disponibles en las **Translated Safety Statements** en PDF publicadas en el sitio web de Allied Telesis en **alliedtelesis.com/us/en/library/search**.

- Consignes de sécurité traduites

  Important: Le symbole ✍ indique que les traductions de la déclaration de sécurité sont disponibles dans le PDF **Translated Safety Statements** publiées sur le site Web de Allied Telesis à l'adresse **alliedtelesis.com/us/en/library/search**.

- Dichiarazioni di sicurezza tradotte

  Importante: ✍ indica che le traduzioni della dichiarazione di sicurezza sono disponibili nelle **Translated Safety Statements** in PDF pubblicate sul sito Web di Allied Telesis all'indirizzo **alliedtelesis.com/us/en/library/search**.

- Översatta säkerhetsförklaringar

  Viktig: ✍ anger att översättningar av säkerhetsförklaringen finns tillgängliga i PDF-dokumentet **Translated Safety Statements** som publicerats på Allied Telesis webbplats på **alliedtelesis.com/us/en/library/search**.

Chapter 1

Overview

This chapter describes the hardware features of the IE340 Switches. The sections in the chapter are listed here:

Hardware Components

The IE340 Switches are Industrial Managed Layer 3 switches that are designed for high performance in harsh environments. They feature eight or sixteen copper ports, two or four SFP transceiver slots, and a Console port for local management. All models, except the IE340-12GT switch, support PoE+ on the copper ports and all models, except the IE340L-18GP switch, come with a USB port.

The IE340 Switches are listed here:

- "IE340-12GP", next
- "IE340-12GT" on page 21
- "IE340-20GP" on page 21
- "IE340L-18GP" on page 22

IE340-12GP

The front panel of the IE340-12GP Switch is shown in Figure 1.

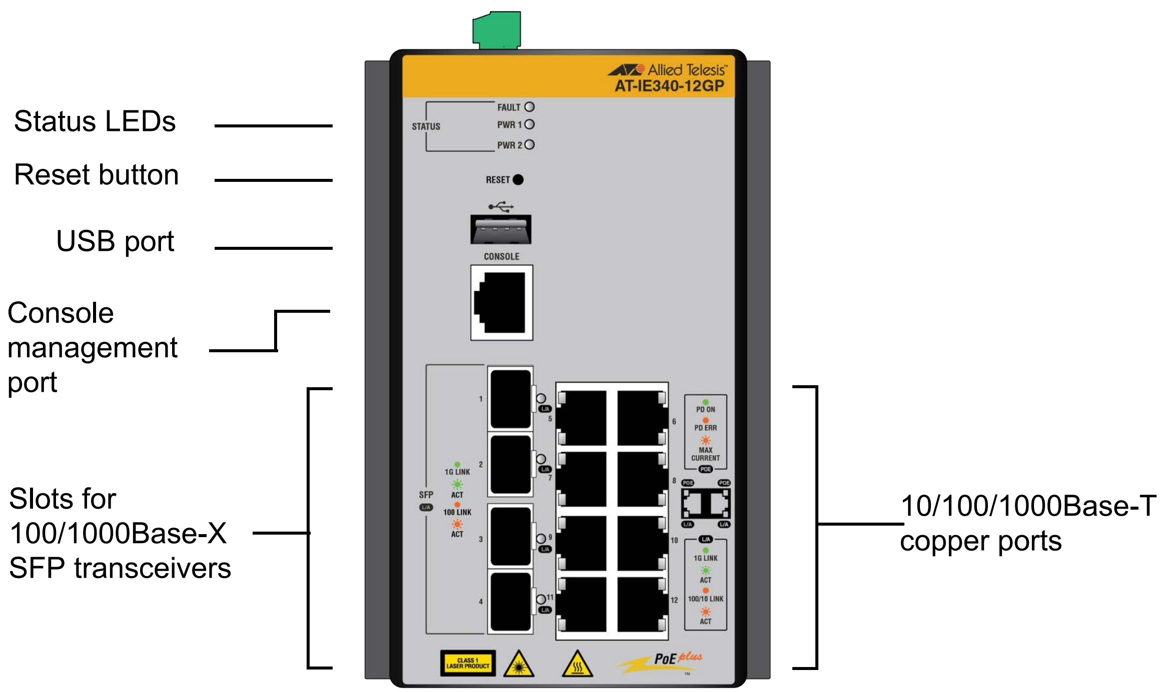


Figure 1. Front Panel of the IE340-12GP Switch

IE340-12GT The front panel of the IE340-12GT Switch is shown in Figure 2.

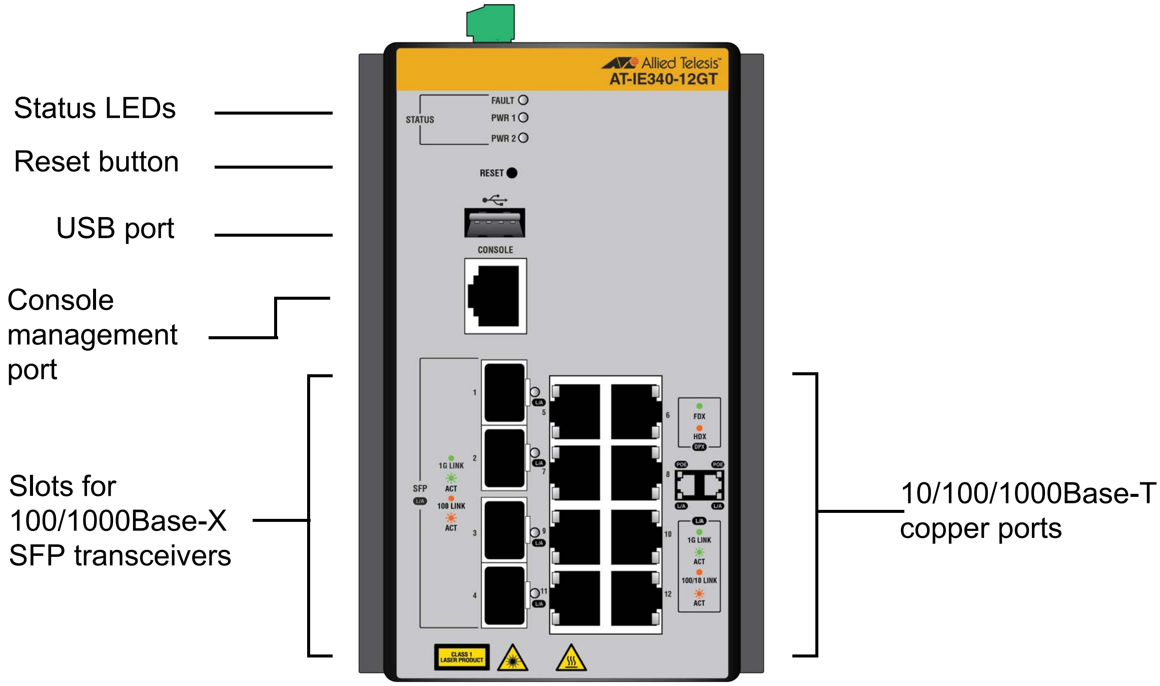


Figure 2. Front Panel of the IE340-12GT Switch

IE340-20GP The front panel of the IE340-20GP Switch is shown in Figure 3.

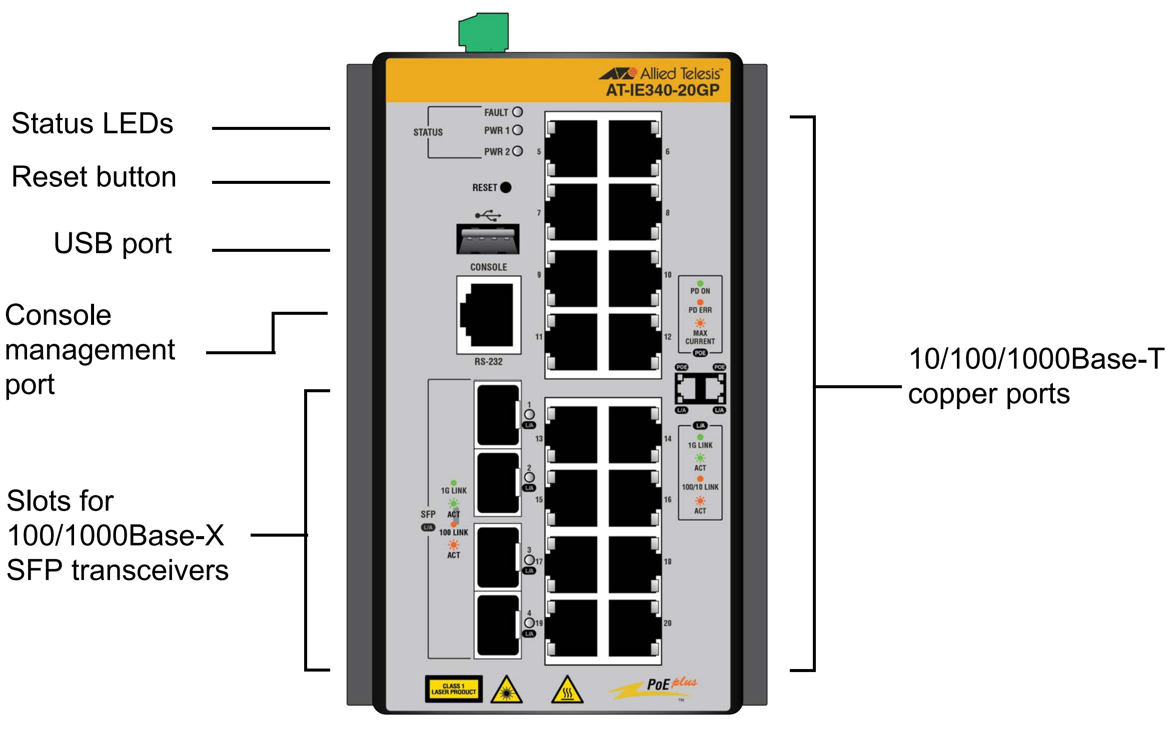


Figure 3. Front Panel of the IE340-20GP Switch

IE340L-18GP

The front panel of the IE340L-18GP Switch is shown in Figure 4.

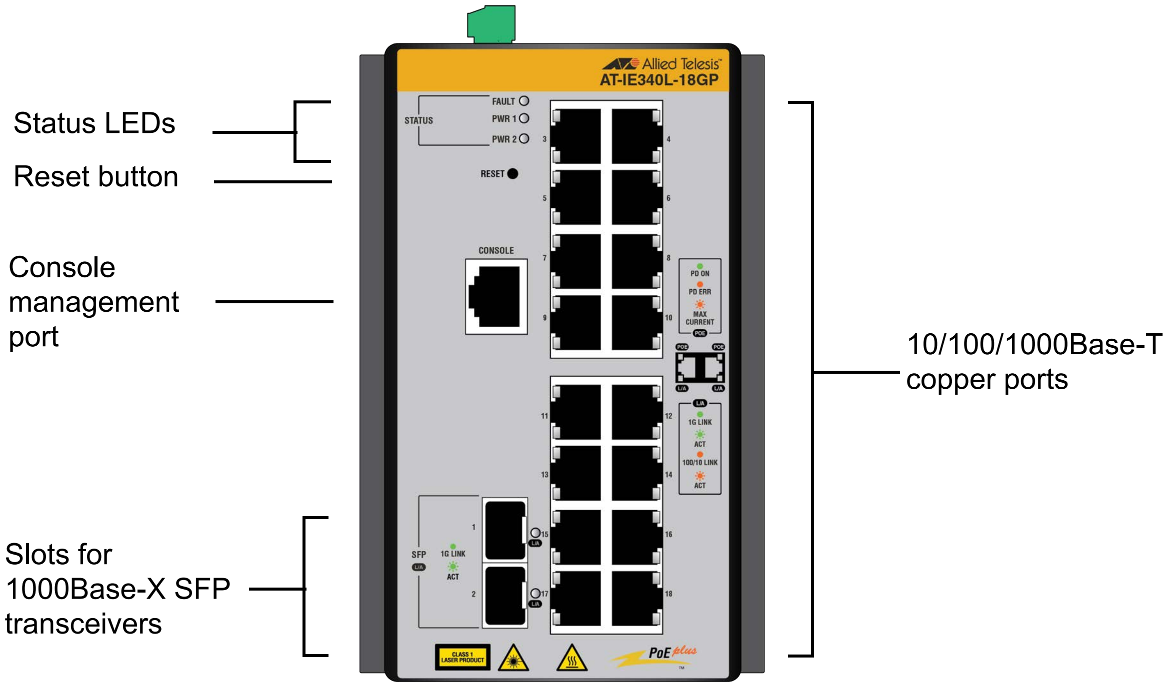


Figure 4. Front Panel of the IE340L-18GP Switch

Top Panels

Figure 5 identifies the components on the top panels of the IE340-12GP, IE340-20GP, and IE340L-18GP Switches.

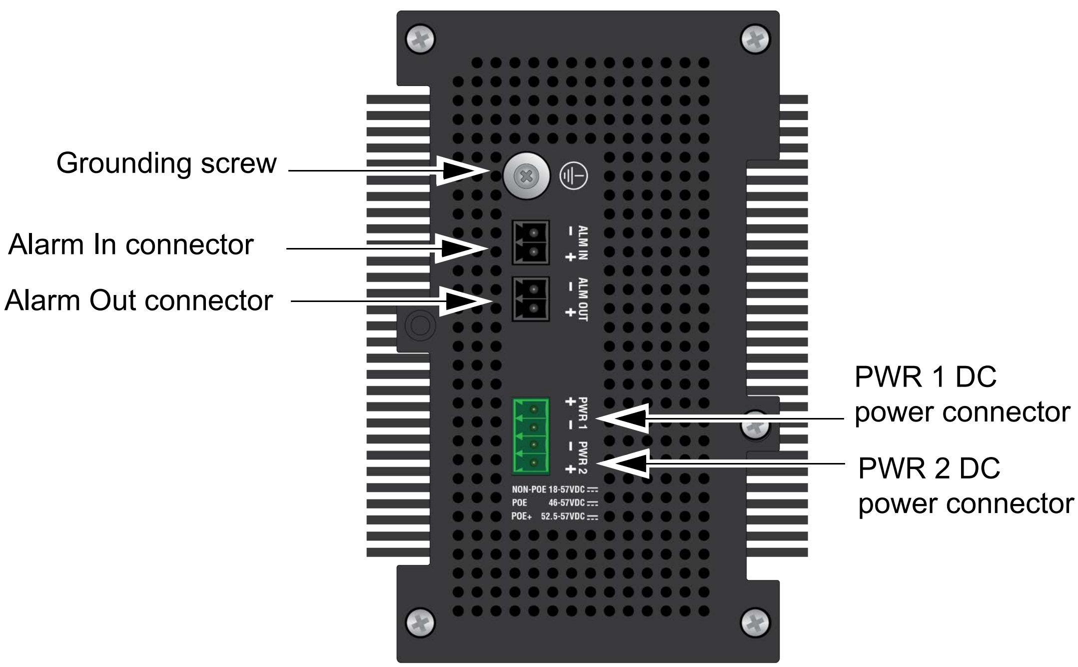


Figure 5. Top Panel of the IE340-12GP, IE340-20GP, and IE340L-18GP Switches

Figure 6 identifies the components on the top panel of the IE340-12GT Switch.

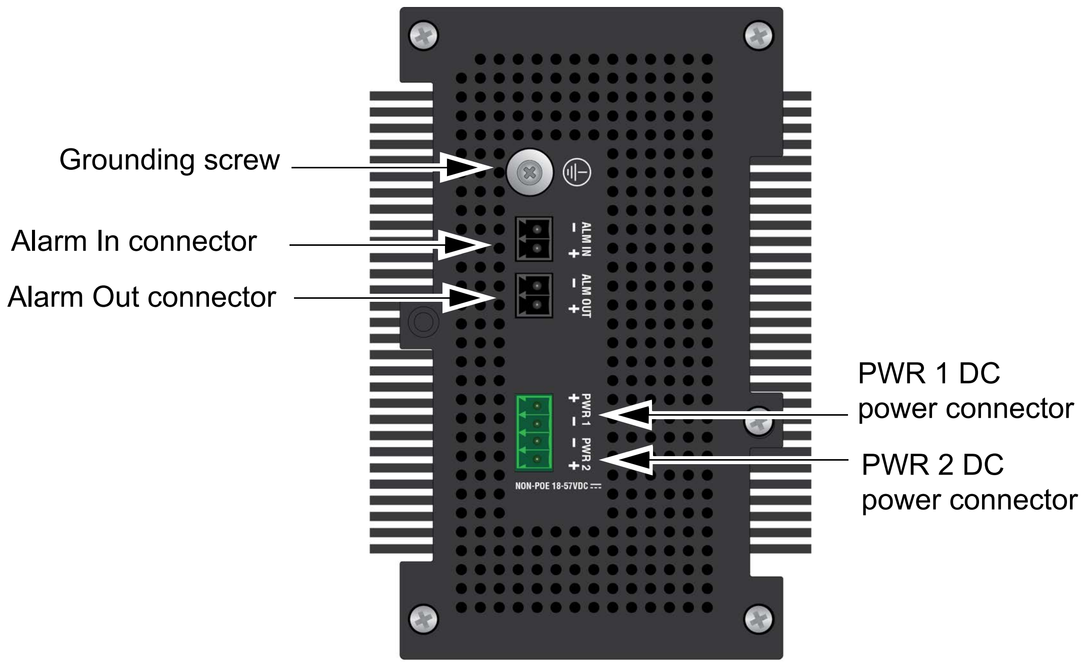


Figure 6. Top Panel of the IE340-12GT Switch

Back Panel

Figure 7 identifies the components on the back panel.

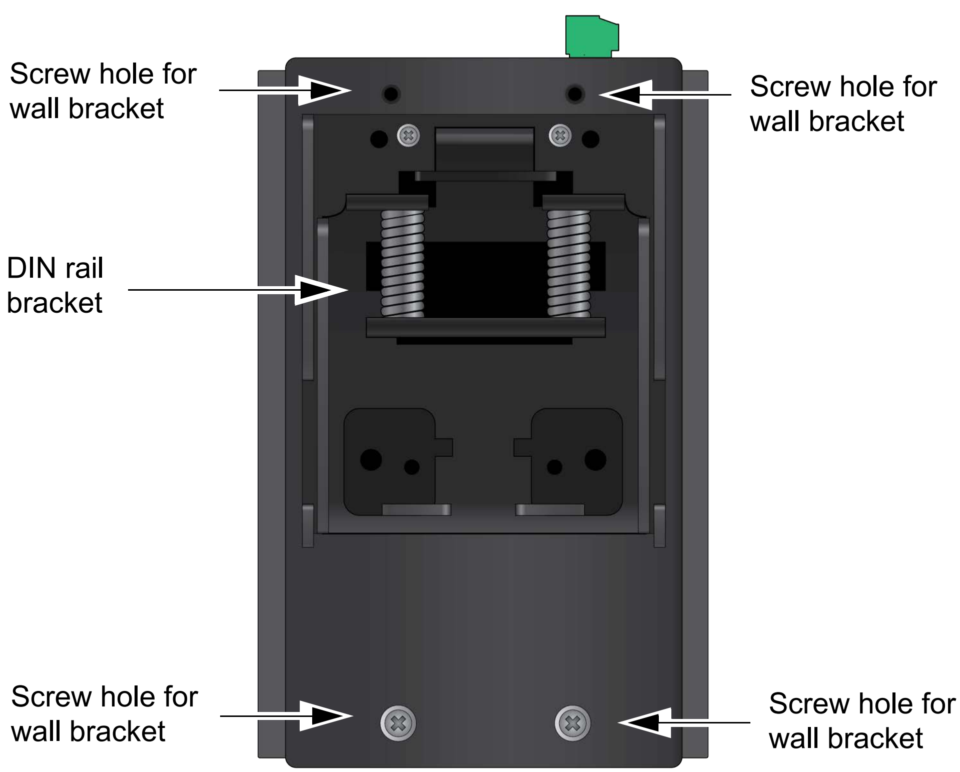


Figure 7. Back Panel

Features

Here are the basic features of the switches.

Copper Ports

Here are the basic features of the copper ports:

- Sixteen ports on the IE340-20GP and IE340L-18GP Switches
- Eight ports on the IE340-12GP and IE340-12GT Switches
- 10M/100M/1G supported on all ports
- IEEE 802.3i 10Base-T compliant
- IEEE 802.3u 100Base-TX compliant
- IEEE 802.3ab 1000Base-T compliant
- IEEE 802.3u Auto-Negotiation compliant
- IEEE 802.3x flow control in full-duplex mode
- IEEE 802.3x back pressure compliant
- Jumbo frames up to 9KB
- RJ-45 connectors

Power Over Ethernet (PoE)

The following IE340 Switches are PoE Power Sourcing Equipment (PSE):

- IE340-12GP
- IE340-20GP
- IE340L-18GP

They support these PoE standards:

- PoE: IEEE 802.3af, IEEE 802.3at Type 1 (15.4W)
- PoE+: IEEE 802.3at, Type 2 (30W)

Additional PoE capabilities include:

- Maximum PoE budget of 240W with one or two power supplies
- Support powered device classes 0 to 4
- Dynamic PoE power budget allocation, according to powered device consumptions and/or PoE port priorities
- Uninterrupted PoE during warm switch restarts

SFP Slots

The number of SFP slots and types of supported transceivers are listed here:

- Four SFP slots on the IE340-12GP, IE340-12GT and IE340-20GP Switches

- Two SFP slots on the IE340L-18GP Switch
- 100Base-FX transceivers (All models except the IE340L-18GP switch.)
- 1000Base-SX/LX transceivers
- Single-port Bi-directional (BiDi) 1000Base-LX transceivers
- 1000Base-ZX transceivers

Note
SFP transceivers are purchased separately.

Protection Circuits

The switches have optimized protection circuits to guard against the following abnormal conditions:

- Reverse input voltage polarity
- Over- and under-voltage
- Over-current
- Peak-current and short-circuit
- Over-temperature

Alarm Monitoring

The alarm facility lets you monitor the switch's environment and respond to problems as they occur. Example of alarm events include:

- Main power supply failure
- Over-temperature
- Port link down
- Power requirements of all powered devices exceeding available power budget
- Powered devices exceeding individual port budgets
- External Alarm contact input

Alarm Connectors

The switches have two alarm connectors:

- Alarm In connector for an external sensor, such as a motion detector or door relay, to monitor the wiring closet or cabinet.
- Alarm Out connector for an external alert device, such as a buzzer or LED, to indicate switch alarms.

LEDs

The switches have the following LEDs:

- System fault
- Status of the power supplies
- Link/activity of the SFP and copper ports

- Duplex mode of the copper ports on the IE340-12GT switch
- PoE sourcing status for the copper ports on the IE340-12GP, IE340-20GP, and IE340L-18GP Switches

MAC Address Tables

Here are the basic features of the MAC address tables:

- Storage capacity of 16,000 MAC address entries
- Automatic learning and aging

Management Software

The switches support the following management software and interfaces:

- AlliedWare Plus management software, version 5.4.9 or later
- Command line interface
- Web browser interface

Management Methods

You can manage the switches in the following ways:

- Local management through the Console port
- Remote Telnet or secure shell (SSH) management
- Remote HTTP or HTTPS web browser management
- SNMPv1, v2c, and v3 for system monitoring
- NETCONF/RESTCONF for network automation
- OpenFlow for network orchestration

Installation Options

The switches support the following installation options:

- DIN rail (compatible with DIN 35x7.5mm rail)
- Concrete or wood wall
- Indoor or outdoor environment

Additional Features

Here are additional features:

- Slot for USB flash memory on the IE340-12GP, IE340-12GT, and IE340-20GP Switches
- Reset button
- DC POWER connector for both primary and redundant power sources
- Extended environmental range
- IP30-compliant
- RJ-45 style Console port for local management

Copper Ports

This section describes the copper ports.

Connector Type

The copper ports have 8-pin RJ-45 connectors. The ports use four pins at 10M or 100M and all eight pins at 1G. The pin assignments are listed in Table 28 on page 136 and Table 29 on page 137.

Speed

The ports can operate at 10M, 100M, or 1G. The switch can set the speeds automatically with Auto-Negotiation, the default setting, or you can manually set the speeds with the AlliedWare Plus operating system.

Note
Copper ports must be set to Auto-Negotiation to operate at 1G.

Duplex Mode

The copper ports can operate in either half- or full-duplex mode at 10M or 100M. Ports operating at 1G can only operate in full-duplex mode. The copper ports are IEEE 802.3u Auto-Negotiation compliant. The switch can set the duplex modes automatically or you can disable Auto-Negotiation and set the duplex modes manually.

Speed and duplex mode settings can be set independently of each other on the ports. For example, the speed of a port can be configured manually while its duplex mode is established through Auto-Negotiation.

Note
Switch ports connected to 10M or 100M end nodes that do not support Auto-Negotiation should not use Auto-Negotiation to set their speed and duplex mode settings, because duplex mode mismatches might occur. You should disable Auto-Negotiation and set the speed and duplex mode settings manually with the AlliedWare Plus operating system.

Maximum Distance

The ports have a maximum operating distance of 100 meters (328 feet).

Cable Requirements

Minimum cable requirements for the copper ports are listed here:

- 10M operations: Standard TIA/EIA 568-compliant Category 3, 100 ohm shielded or unshielded cabling, complying with IEEE 802.3i 10Base-T specifications.
- 100M operations: Standard TIA/EIA 568-compliant Category 5, 100 ohm shielded or unshielded cabling, complying with IEEE 802.3u 100Base-TX specifications.
- 1G operations: Standard TIA/EIA 568-compliant Category 5, 100 ohm, 4-pair shielded or unshielded cabling, complying with IEEE 802.3ab 1000Base-T specifications. Category 5e is recommended.

Note
Category 3 and 5 cables may be used for EN55035 immunity levels.

Note
Category 6 or 6a shielded or unshielded cable is required in high RF noise environments.

Automatic MDIX Detection

The copper ports are IEEE 802.3ab compliant, with automatic MDIX detection at 10M or 100M. (Automatic MDIX detection does not apply to 1G.) This feature automatically configures the ports to MDI or MDI-X depending on the wiring configurations of the end nodes.

Switch ports connected to network devices that do not support automatic MDIX detection default to MDIX.

You may disable automatic MDIX detection on the individual ports and configure the MDI/MDI-X settings manually.

Port Pinouts

Refer to Table 28 on page 136 for the pinouts of the copper ports at 10M or 100M and to Table 29 on page 137 for the port pinouts at 1G.

Power over Ethernet

The section explains the Power over Ethernet (PoE) Power Sourcing Equipment (PSE) feature for the following IE340 Switches:

- IE340-12GP
- IE340-20GP
- IE340L-18GP

Note
The IE340-12GT Switch does not support PoE PSE.

The PoE PSE feature allows the switches to supply electrical power to network devices over the same copper cables that carry network traffic. Devices that can receive power over Ethernet cables are called powered devices (PD). Examples include wireless access points, IP telephones, web cams, and even other Ethernet switches. PoE can simplify network installations and maintenance by letting you use the switches as central power sources for other network devices.

PoE Versions

The IE340 PoE PSE Switches support the following versions of PoE:

- PoE (IEEE 802.3af, IEEE 802.3at Type 1)
- PoE+ (IEEE 802.3at Type 2)

Table 1 lists the switch ports that source PoE and the maximum power levels.

Table 1. PoE Sourcing Ports and Maximum Power Levels

PoE Version	Port Numbers			Maximum Power Output at Switch Port	Maximum Power at PD
	IE340-12GP	IE340-20GP	IE340L-18GP		
PoE	5 to 12	5 to 20	3 to 18	15.4W	12.95W
PoE+	5 to 12	5 to 20	3 to 18	30.0W	25.5W

Powered Device Classes

The IEEE 802.3af and IEEE 802.3at PoE standards define the five levels of powered devices listed in Table 2. The IE340 PoE Switches support all five classes of powered devices.

Table 2. PoE and PoE+ Device Classes

Class	Usage	Maximum Power Output at the Switch Port	PD Power Range
0	Default	15.4W	0.44W to 12.95W
1	Optional	4.0W	0.44W to 3.84W
2	Optional	7.0W	3.84W to 6.49W
3	Optional	15.4W	6.49W to 12.95W
4	Optional	30.0W	12.95W to 25.9W

PoE Power Budget

PoE power budget is the maximum amount of DC power that the switches can supply to powered devices on their copper ports. The IE340 PoE Switches have a maximum power budget of 240W when powered by the IE048-480 Power Supply or an equivalent power supply from a third-party manufacturer.

Note
IE340 PoE Switches may have lower PoE budgets if they are powered by power supplies that do not meet the requirements in “Switch DC Power Requirements” on page 50 and “DC Power Specifications” on page 132.

The number of powered devices the switches can support at one time depends on their PoE budgets, which is dependent on the power supply, and the wattage requirements of the powered devices. To determine whether the wattage requirements of the PoE devices you plan to connect to a switch exceed its budget, see their documentation for their power requirements and add the requirements together.

Switches can power all devices simultaneously as long as the total power requirement of the devices is below their PoE power budgets. If the total exceeds the available power budget of a switch, you should consider reducing the number of PoE devices so that all devices receive power. Otherwise, switches will power a subset of the devices, based on PoE port priorities.

The switch can handle different power requirements on different ports. This enables you to connect different classes of PoE equipment to the ports on the switch.

Power Delivery with Alternatives A and B

The PoE standards define two methods for delivering power over copper cables from power sources such as the IE340 PoE Switches to powered devices. The methods, called Alternatives A and B, identify the wire strands that carry the electrical power over the Ethernet cables to the powered devices from the PoE switches.

Copper cabling usually has eight strands. Devices that operate at 10M or 100M use the wire strands connected to pins 1, 2, 3, and 6 to carry the network traffic, while the strands connected to pins 4, 5, 7, and 8 are unused. Devices that operate at 1G use all eight strands to carry network traffic.

In Alternative A, power is delivered on strands 1, 2, 3, and 6, which are the same strands that carry the 10M and 100M network traffic. In Alternative B, power is delivered on strands 4, 5, 7, and 8, which are the unused strands at 10M and 100M.

The IE340 PoE Switches support Alternative A. They support PoE and PoE+ powered devices that comply with the IEEE 802.3af and 802.3at standards, which require that powered devices support both Alternatives A and B.

Note
Legacy Powered Devices that are non-standard or were manufactured before the completion of the standards and support only one method might not be compatible with the IE340 PoE Switches.

PoE Port Priorities

If the power requirements of the powered devices exceed the switch’s power budget, the switch will deny power to some ports based on a system called PoE port priorities. You may use this mechanism to ensure that powered devices critical to the operations of your network are given preferential treatment by the switch in the distribution of power should the demands of the devices exceed the available capacity.

There are three priority levels:

- Critical
- High
- Low

Ports set to the Critical level, the highest priority level, are guaranteed power before any of the ports assigned to the other two priority levels. Ports assigned to the other priority levels receive power only if all the Critical ports are receiving power. Ports that are connected to your most critical powered devices should be assigned to this level. If there is not enough power to support all the ports set to the Critical priority level, power is provided to the ports based on port number, in ascending order.

The High level is the second highest level. Ports set to this level receive power only if all the ports set to the Critical level are already receiving power. If there is not enough power to support all of the ports set to the High priority level, power is provided to the ports based on port number, in ascending order.

The lowest priority level is Low. This is the default setting. Ports set to this level only receive power if all of the ports assigned to the other two levels are already receiving power. As with the other levels, if there is not enough power to support all of the ports set to the Low priority level, power is provided to the ports based on port number, in ascending order.

Power allocation is dynamic. Ports supplying power to powered devices may cease power transmission if the switch’s power budget is at maximum usage and new powered devices, connected to ports with higher priorities, become active.

SFP Slots

The following IE340 Switches have four slots for 100/1000Base-X fiber optic, MSA-compliant SFP transceivers:

- IE340-12GP
- IE340-12GT
- IE340-20GP

The IE340L-18GP Switch has two SFP slots for Ethernet 1000Base-X fiber optic, MSA-compliant SFP transceivers.

You can use transceivers to connect switches to other network devices over large distances, build a high-speed backbone network between network devices, or connect high-speed devices, such as servers, to your network.

Refer to the product data sheet for a list of supported Ethernet transceivers.

To protect SFP transceivers from heat-related damage, you should select transceivers whose maximum operating temperatures exceed the anticipated maximum ambient temperature at the switch installation site. Table 3 provides recommendations for SFP maximum operating temperatures for several ambient site temperatures.

Table 3. Maximum Installation Site Temperatures Versus SFP Temperature Ratings

Maximum Ambient Installation Site Temperature	Recommended Maximum SFP Operating Temperature
75 °C (167° F)[a]	105 °C (221° F)
65 °C (149° F)	95 °C (203° F)
55 °C (131° F)	85 °C (185° F)
≤40 °C (≤104° F)	70 °C (158° F)

a. The 75 °C ambient and 105 °C SFP operating temperatures are not applicable to IE340L-18GP switch, which has a maximum ambient temperature of 65 °C.

LEDs

The following sections describe the LEDs on the switches:

- “Status LEDs”, next
- “Copper Port LEDs on PoE PSE Switches” on page 36
- “Copper Port LEDs on the IE340-12GT Switch” on page 37
- “SFP Slot LEDs” on page 38

Status LEDs

The status LEDs are defined in Table 4.

Table 4. Status LEDs

LED	State	Description
Fault	Off	The switch is operating normally or powered off.
	Solid Amber	The switch is booting up.
	Five flashes followed by a pause	The switch is experiencing an alarm condition. Use the SHOW FACILITY-ALARM STATUS command to view active alarms. The ALARM FACILITY command in the Global Configuration mode is the command for programming the Fault LED to flash in response to an alarm condition. The following example of the command configures the switch to flash the Fault LED if port 1 does not have a link to a network device: `alarm facility link-down port1.0.1 led` For more information, refer to the *Software Reference for IE340 Series Switches* or *Command Reference for IE340 Series Switches*.
	Six flashes in two seconds	The switch is overheating and might shutdown.

Table 4. Status LEDs (Continued)

LED	State	Description
PWR1	Off	The switch is not receiving power on the PWR 1 connector or the input power from the DC power supply is outside the normal operating range of the unit.
	Solid Green	The switch is receiving power on the PWR 1 connector and is operating normally.
	Solid Yellow	The switch is receiving power on the PWR1 connector, but the power is under the minimum voltages listed here: - IE340-12GT Switch: 18Vdc - All other IE340 Switches: 52.5Vdc (PoE+ voltage threshold)
	Solid Red	The switch is receiving power on the PWR1 connector, but the power exceeds the maximum voltage. The maximum voltage depends upon the operating mode.
PWR2	Off	The switch is not receiving power on the PWR 2 connector or the input power from the DC power supply is outside the normal operating range of the unit.
	Solid Green	The switch is receiving power on the PWR 2 connector and is operating normally.
	Solid Yellow	The switch is receiving power on the PWR2 connector, but the power is under the minimum voltages listed here: - IE340-12GT Switch: 18Vdc - All other IE340 Switches: 52.5Vdc (PoE+ voltage threshold)
	Solid Red	The switch is receiving power on the PWR2 connector, but the power exceeds the maximum voltage. The maximum voltage depends on the operating mode.

Copper Port LEDs on PoE PSE Switches

The copper ports on the IE340 PoE PSE Switches have two LEDs each. The LEDs are identified in Figure 8.

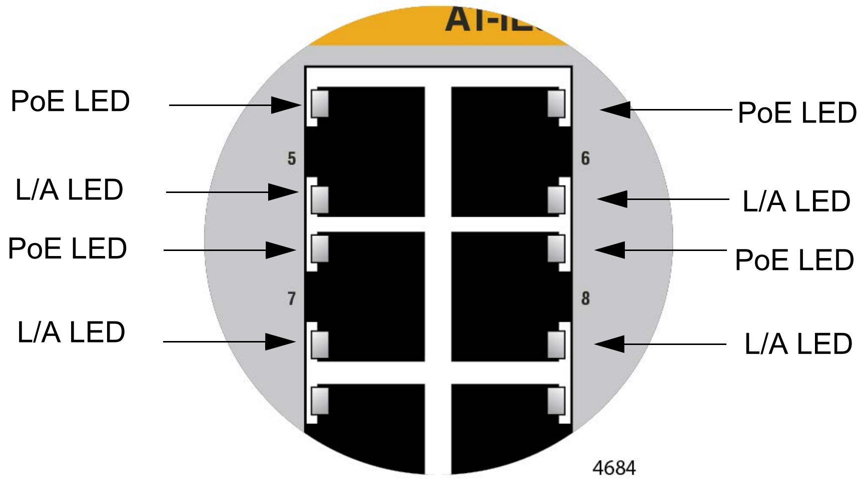


Figure 8. Copper Port LEDs on the IE340 PoE PSE Switches

The states of the LEDs are defined in Table 5.

Table 5. Copper Port LEDs on the IE340 PoE PSE Switches

LED	State	Description
PoE	Solid Green	The port is delivering power to a powered device.
	Solid Amber	The port is connected to a powered device but the switch has shutdown PoE on it because of a fault condition.
	Flashing Amber	The port is connected to a powered device but is not delivering power to it because the switch does not have sufficient unused power.
	Off	This LED state can result from the following conditions: - The port is connected to a non-PoE device. - The PD is powered off. - The port is disabled in the management software. - PoE is disabled on the port.

Table 5. Copper Port LEDs on the IE340 PoE PSE Switches (Continued)

LED	State	Description
L/A	Solid Green	The port has established a 1G link to a network device.
	Flashing Green	The port is transmitting or receiving data at 1G.
	Solid Amber	The port has established a 10M or 100M link to a network device.
	Flashing Amber	The port is transmitting or receiving data at 10M or 100M.
	Off	The port has not established a link with another network device.

Copper Port LEDs on the IE340-12GT Switch

The LEDs of the copper ports on the IE340-12GT Switch are identified in Figure 9.

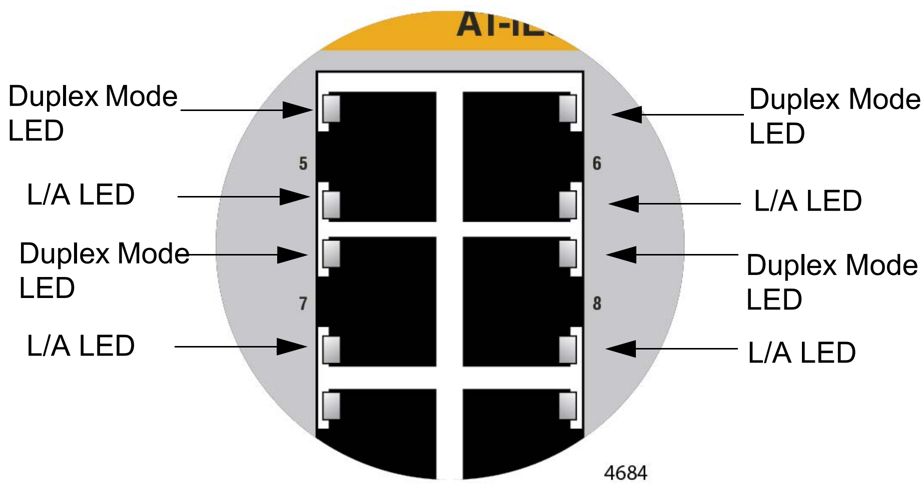


Figure 9. Copper Port LEDs on the IE340-12GT Switch

The states of the copper port LEDs are defined in Table 6 on page 38.

Table 6. Copper Port LEDs on the IE340-12GT Switch

LED	State	Description
Duplex Mode	Solid Green	The port is operating in full duplex mode.
	Solid Amber	The port is operating in half duplex mode.
	Off	The port has not established a link with a network device.
L/A	Solid Green	The port has established a 1G link to a network device.
	Flashing Green	The port is transmitting or receiving data at 1G.
	Solid Amber	The port has established a 10M or 100M link to a network device.
	Flashing Amber	The port is transmitting or receiving data at 10M or 100M.
	Off	The port has not established a link with another network device.

SFP Slot LEDs

Each SFP slot has one LED. For the IE340-12GP, IE340-12GT, and IE340-20GP Switches, see Table 7. For the IE340L-18GP switch, see Table 8 on page 39.

Table 7. SFP Slot LED for the IE340-12GP, IE340-12GT, and IE340-20GP Models

State	Description
Solid Green	The port has established a 1G link to a network device.
Flashing Green	The port is transmitting or receiving network packet traffic at 1G.
Solid Amber	The port has established a 100M link to a network device.
Flashing Amber	The port is transmitting or receiving network packet traffic at 100M.
Off	The port has not established a link to a network device.

Table 8. SFP Slot LED for IE340L-18GP Model

State	Description
Solid Green	The port has established a 1G link to a network device.
Flashing Green	The port is transmitting or receiving network packet traffic at 1G.
Off	The port has not established a link to a network device.

Console Port

The Console port is a serial RS-232 port that you use to configure the features of the switches with the AlliedWare Plus management software. Management sessions conducted through the Console port are called local management sessions because you have to be at the location of the switch. Local management sessions do not interfere with the network operations of the switch. The switch does not need an IP address for local management sessions.

Local management sessions require the following items:

- Terminal or a personal computer with a terminal emulation program
- Management cable

The switch comes with a management cable that is compatible with computers with DB-9 female connectors. Refer to Figure 10. If you need a replacement cable, you can purchase one or build your own. Refer to Table 30 on page 138 for the pin assignments of the Console port.

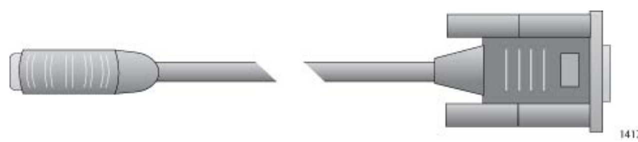


Figure 10. Console Management Cable

For workstations with a USB connector, Allied Telesis offers the VT-Kit3 management cable. The cable has a USB-A male connector and an RJ-45 female connector. Refer to Figure 11.

Figure 11. VT-Kit3 Management Cable

You connect the cable to a USB port on your workstation and to the Console port on the switch with a standard, straight-through Ethernet cable. Refer to Figure 12 on page 41. The VT-Kit3 management cable and software driver are sold separately.

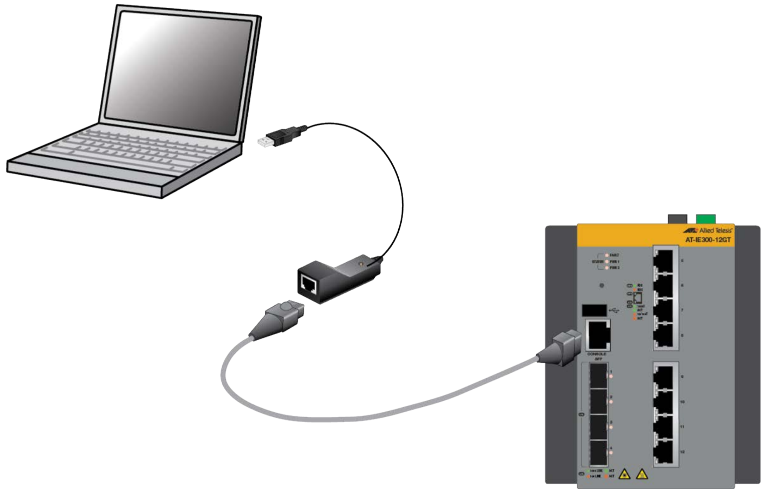


Figure 12. Local Management with the VT-Kit3 Management Cable

The Console port has the following settings:

- Default baud rate: 9600 bps (Range is 9600 to 115200 bps)
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Note
These settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulation program.

For instructions on how to start a management session, refer to “Starting a Management Session” on page 113.

The pin assignments of the Console port are provided in “RJ-45 Style Serial Console Port Pinouts” on page 138.

USB Port

The USB port can be used with a flash drive for the following management functions:

- Use Allied Telesis Autonomous Management Framework (AMF) to provide a centralized network backup location.
- Store backup copies of configuration files.
- Transfer configuration files between switches.
- Store or transfer log files.
- Store or transfer debug files (for example, the output of the SHOW TECH-SUPPORT command).
- Boot the AlliedWare Plus management software and master configuration file from flash drive.

Note
The port is compatible with USB v1.0 and v2.0 flash drives. Operating the switch with a flash drive is optional.

Caution
Do not leave a flash drive in the USB port when the ambient temperature exceeds 65°C.

Note
The IE340L-18GP switch does not have a USB port.

Reset Button

The Reset button resets the switch. You might reset the switch if it is experiencing a problem. The reset button is recessed in the chassis. To press it, use a straightened paper-clip or similar object.

Caution
The switch does not forward network traffic during the reboot process. Some network traffic may be lost. E113

Note
The reboot process may take two to three minutes.

Note
Unsaved changes to the configuration settings of the switch are discarded when you reset the device.

Ground Screw

The ground screw is used to connect the chassis to the earth ground at the installation site. The instructions for connecting the post are provided later in this guide.

Warning
The switch must be connected to an earth ground. Do not operate the device without an earth ground. E129

POWER Connector

The PWR 1 and PWR 2 circuits on the POWER connector are for the DC power wires from the DCpower supplies. You can power the unit with one or two DC power supplies. Powering the unit with two power supplies provides power redundancy, which can protect the device from power loss in the event a power unit fails or loses power. The switches support the following types of power sources:

- AC/DC rectifiers
- Un-interruptible power supplies

For power supply requirements, see “Switch DC Power Requirements” on page 50.

Alarm In Connector

The switch has a 2-pin Alarm In (ALM IN) connector for an external sensor on the top panel. The switch can use an external sensor to monitor the wiring room or cabinet for unauthorized access or for changes in the room's environment, such as the temperature or humidity. Here are examples of the types of sensors you can attach to the connector:

- Door
- Temperature
- Motion detector
- Light
- Humidity

The two pins of the connector, referred to as contact alarm 1 in the operating system, act as a electrical circuit. The switch places a 3.3VDC voltage on the circuit and monitors its status, which can be either closed or open. A closed circuit is on, meaning that voltage can flow through the circuit, while an open circuit is off, preventing the flow of voltage through the circuit.

The switch performs one or more of the following functions when the state of the external sensor changes to open or closed.

- Transmits an SNMP trap.
- Flashes the Fault LED.
- Activates the device on the Alarm Out (ALM OUT) connector.

You use the ALARM FACILITY INPUT-ALARM command in the AlliedWare Plus operating system to specify the state of the external sensor that signals an alarm. Alarms remain active until their causes are resolved. For instructions on the command, refer to the *Software Reference for IE340 Switches*.

Here are the requirements for the external sensor:

- It must be a dry contact.
- It must not place any current on the circuit.
- It must not use the voltage or current for its own operations.
- It must be able to handle a minimum of 3.3VDC and 320uA.

Caution
The external sensor might damage the Alarm In connector if it places a voltage on the circuit. E118

The example in Figure 13 shows the Alarm In connector attached to a door sensor. The sensor is installed such that it is closed (on) when the door is closed and open (off) when the door is open.

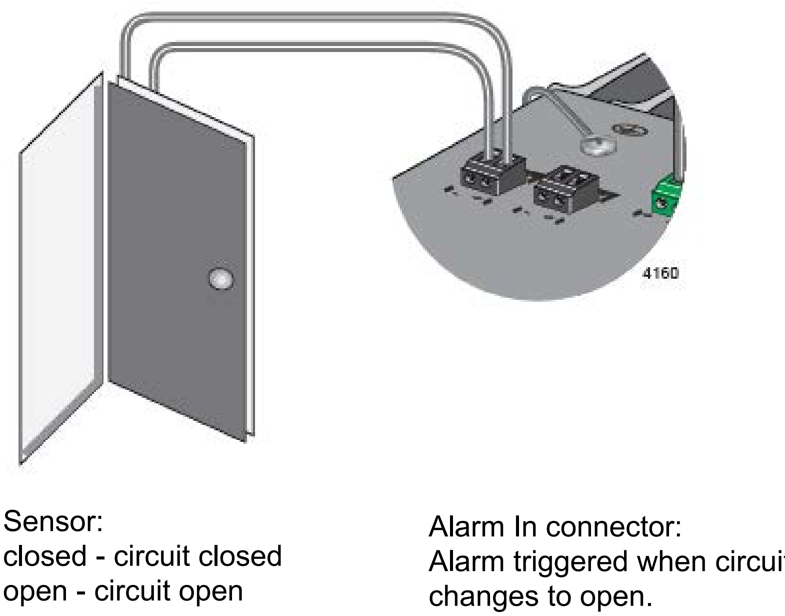


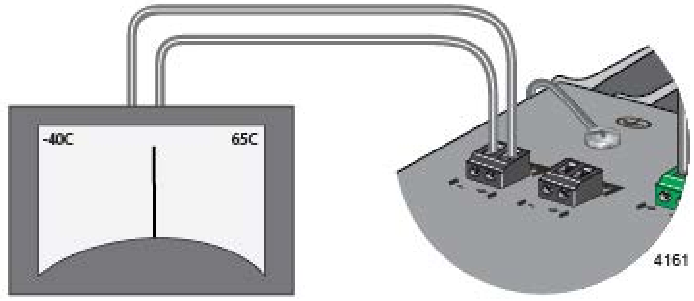
Figure 13. Example 1 of the Alarm In (ALM IN) Connector

To have the switch generate an alarm when someone opens the door, you enter the following ALARM FACILITY INPUT-ALARM command. The command configures the switch to generate an alarm when the state of the sensor changes from closed to open.

```
awplus(config)# alarm facility input-alarm 1 alarm-
position open
```

The alarm remains active until the door is closed again.

In the example in Figure 14 on page 47, the Alarm In connector is connected to a temperature sensor. The sensor is configured to be open (off) at temperatures of 30° C or below and closed (on) at temperatures above 30° C.



Temperature Sensor:
Temperature <30C - circuit open
Temperature >30C - circuit closed

Alarm In connector:
Alarm triggered when circuit changes to closed.

Figure 14. Example 2 of the Alarm In (ALM IN) Connector

To have the switch trigger an alarm when the temperature exceeds 30° C, you enter the following ALARM FACILITY INPUT-ALARM command:

```
awplus(config)# alarm facility input-alarm 1 alarm-
position close
```

The command configures the switch to signal the alarm when the sensor changes to closed above 30° C. When the temperature falls below 30° C, and the temperature sensor changes from closed to open, the switch automatically cancels the alarm.

Note
External sensors are not available from Allied Telesis.

Alarm Out Connector

The switch has a 2-pin Alarm Out (ALM OUT) connector on the top panel for an external alert device. The switch can use the device to alert you to alarm conditions, such as power supply failures or ports without links. Here are two examples of alert devices for the Alarm Out connector:

- LEDs
- Buzzers

The switch does not supply power on the Alarm Out circuit. Instead, the circuit is an on or off dry contact relay. When an alarm occurs, the switch changes the circuit from closed (on) to open (off). The circuit remains open until the alarm is resolved, at which point the switch automatically closes it again. The processes to resolving alarms can vary.

The external alert device has to provide the necessary power for the circuit and be able to monitor the circuit for when it is closed or open. Here are the power specifications for the circuit:

- 30VDC maximum
- 0.5A maximum

Caution
The external alert device must not exceed the above specifications. The Alarm Out connector can be damaged by devices that exceed the specifications. E119

You use the ALARM FACILITY RELAY command to specify the alarm condition that opens the Alarm Out circuit. Examples of alarm conditions are power supply failures, ports without links, and loop detections. For instructions on the command, refer to the *Software Reference for IE340 Switches*.

An example of the feature is illustrated in Figure 15 on page 49. The Alarm Out connector is attached to a blue LED alert device. The alert device is configured such that its LED is off when the circuit is closed and on when the circuit is open.

Now assume you want the switch to open the circuit and activate the LED on the alert device whenever any port on the switch does not have a link to a network device. Here are the ALARM FACILITY RELAY commands:

- IE340-20GP:

```
awplus(config)# alarm facility link-down
port1.0.1-port1.0.20 relay
```

- IE340L-18GP:

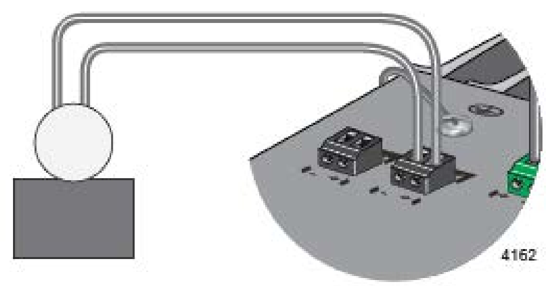
```
awplus(config)# alarm facility link-down
port1.0.1-port1.0.18 relay
```

- IE340-12GP and IE340-12GT:

```
awplus(config)# alarm facility link-down
port1.0.1-port1.0.12 relay
```

If the switch detects that a port does not have a link, it changes the circuit from closed to open. The alert device, detecting the change to the circuit, turns on the LED. When the switch detects that all its ports have links again, it closes the circuit, which turns off the LED.

Note
Alarm devices are not available from Allied Telesis.



Blue LED
Circuit closed - LED off
Circuit open - LED on

Figure 15. Example of the Alarm Out Port

DIN Rail Bracket

The switch comes with one DIN rail bracket pre-installed on the back panel. The bracket is compatible with DIN 35 x 7.5mm rails.

Screw Holes for Wall Brackets

The back panel has four holes for securing the two wall brackets included in the accessory kit.

Switch DC Power Requirements

You can power the IE340 Switches with the IE048-480 Power Supply from Allied Telesis or power supplies from third-party manufacturers that meet the requirements in Table 9 on page 51 and “DC Power Specifications” on page 132. They should also support the environment of the location site.

Warning
Use a UL-listed DC power supply with 48VDC/10A output. It should be suitable for the operating altitude and maximum ambient temperature of the physical location of the switch. Refer to the installation instructions from the manufacturer for installation and safety guidelines.

The IE340 Switches have the following power supply requirements:

- The DC input voltage for the IE340-12GP, IE340-12GT, and IE340-20GP Switches has to be between 18 and 57Vdc; this range is absolute with no tolerance.
- The DC input voltage for the IE340L-18GP Switch has to be between 46 and 57Vdc; this range is absolute with no tolerance.
- DC input voltage has to meet the requirements in Table 9 on page 51 to support PoE sourcing.
- DC input voltage must not exceed 57Vdc to avoid the device breakdown.
- DC input current has to be available continuously over the operating temperature range and required consumption.

Note
The IE340 Switches can be powered by one or two power supplies. A single power supply that meets the above requirements can fully power the switches. Adding a second power supply adds power redundancy.

IE340 PoE Switches operate in the following modes:

- Non-PoE mode: All network devices connected to the switch do not require PoE sourcing.
- PoE mode: Some or all network devices connected to the switch require PoE sourcing, in accordance with std. IEEE 802.3at Type 1 “PoE.”
- PoE+ mode. Some or all network devices connected to the switch require PoE sourcing, in accordance with std. IEEE 802.3at Type 1 and or Type 2 “PoE+.”

Table 9 describes the input voltage requirements; the listed voltage ranges are absolute with no tolerance.

Table 9. Input Voltage Requirements

Mode	Input Voltage Range		Recommended Input Voltage	Over-voltage Alarm
Non-PoE	IE340-12GP IE340-12GT IE340-20GP	18.0 to 57.0 VDC	24 VDC, 48 VDC	≥ 57 VDC
	IE340L-18GP	46.0 to 57.0 VDC	48 VDC	
PoE	46.0 to 57.0 VDC		54 VDC	
PoE+	52.5 to 57.0 VDC			

Note
An input voltage of 53.5VDC on the IE340 PoE Switches ensures the maximum power budget of 240W for the powered devices.

Power Supplies

You can power IE340 Switches with the IE048-480 Power Supply from Allied Telesis. The power supply is an industrial product with an extended operating temperature for harsh environments, such as those found in industrial applications. The IE048-480 Power Supply is sold separately. Here are main features:

- 480W output power
- Wide input voltage range: 85 ~ 264Vac
- Wide operating temperature range: -25 ~ 70°C
- Electromagnetic immunity (EMI) suitable for industrial applications
- High efficiency: 94% @230Vac
- 150% peak current capability
- Active PFC: PF type. 0.93 @230Vac
- Protection circuits: peak-current, over-current, over-voltage, over-temperature
- Remote ON/OFF
- Output power confirmation relay (DC_OK)
- DIN rail mount

Warning
The IE048-480 Power Supply and other non-compliant UL/EN/IEC 61010-1 and 61010-2-201 power supplies must be installed in fire protection enclosures when installed on walls of combustible material (e.g., wood). Additionally, the floor area directly below the power supplies should be non-combustible (e.g., metal or concrete) and free of combustible material (e.g., paper, plastic, or wood).

Caution
The output power of the IE048-480 Power Supply is affected by the input voltage and ambient temperature. Refer to the data sheet for the derating curve.

Note
Power supplies from third-party manufacturers must meet the power requirements in Table 9 on page 51 and “DC Power Specifications” on page 132 to be compatible with IE340 Switches.

Chapter 2

Beginning the Installation

The chapter contains the following sections:

Reviewing Safety Precautions

Please review the following safety precautions before beginning the installation procedures.

Note
Safety statements that have the symbol are translated into multiple languages in the *Translated Safety Statements* document at **www.alliedtelesis.com/support**.

Warning
Class 1 Laser product. L1

Warning
Laser Radiation.
Class 1M Laser product. L9

Warning
Do not stare into the laser beam. L2

Warning
Do not look directly at the fiber optic ends or inspect the cable ends with an optical lens. L6

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. E124

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

Note
An appropriate disconnect device must be provided as part of the building or enclosure installation.

Warning
Use a UL-listed DC power supply having 48VDC/10A output and being suitable for the maximum operating altitude of 3,000 m and the maximum ambient temperature of the switch's location.

Warning
This equipment must be earthed. The ground screw on the unit must be connected to a properly earthed bonding point. E120

Note
Ground resistance from the building primary bonding point to earth should be less than 5 ohms.

Caution
Air flow around the unit and through the cooling fins must not be restricted. E20

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

Warning
Only trained and qualified personnel are allowed to install or replace this equipment. E14

Caution
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. E21

Warning

This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. E30

Caution

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

Warning

The temperature of an operational SFP or SFP+ transceiver can exceed 70° C (158° F). Exercise caution when handling transceivers with unprotected hands. E43

Caution

An Energy Hazard exists inside this equipment. Do not insert hands or tools into open chassis slots or plugs. E44

Warning

This equipment shall be installed in a Restricted Access location. E45

Warning

Install the switch in a UL-listed Type 3X or 4X enclosure when installing it in an outdoor environment.

Warning

An operational unit can be hot. Exercise caution when handling with unprotected hands.

Warning

Per NEC section 800.90, all exposed cables, service wires, or drops entering a building must have primary over-voltage protection if they are classified as exposed plants. E121

Note
The equipment meets EN61000-4-5 Class 3 on the DC inputs and Ethernet ports.

Note
Allied Telesis does not warrant against lightning or power surges damaging the device. Such damage will be the responsibility of the equipment owner.

Safety Precautions When Working with Electricity

Please review the following additional safety guidelines before beginning the installation procedure.

- Disconnect all power by turning off the circuit breakers before installing or removing the device or when working with the power supplies.
- Do not work alone if potential hazards exist.
- Never assume that the power is disconnected from a circuit; always check the circuit.
- Inspect the work area carefully for possible hazards, such as moist floors, ungrounded power extension cables, frayed power cord, or missing safety grounds.

If an electrical accident occurs, proceed as follows:

- Use caution; do not become a victim yourself.
- Turn off power to the system.
- If possible, send another person to get medical aid. Otherwise, access the condition of the victim and then call for help.
- Determine if the person needs rescue breathing or external cardiac compressions and take appropriate action.

Reviewing Site Requirements

Please observe the following requirements and guidelines when choosing a site for the switch:

Warning
You must install the switch in a UL Listed 3X or 4X enclosure when installing it in an outdoor environment.

- The switch must be installed in a Restricted Access location.
- The switch does not require an enclosure when installed in most indoor environments.
- The IE340-12GP, IE340-12GT, and IE340-20GP Switches must be installed in a UL Listed or Nationally Recognized Test Lab enclosure when used in a Measurement, Control, or Laboratory indoor environment, as specified in UL/EN/IEC 61010-1 and 61010-2-201.
- The IE340L-18GP Switch is not compliant with UL/EN/IEC 61010-1 and 61010-2-201 and should not be used in an indoor Measurement, Control, or Laboratory environment.
- You can install the switch on a concrete wall, wooden wall, or DIN 35x7.5mm rail.
- You should not install the switch on a wall that has metal studs. Metal studs might not be strong enough to safely support the device.
- You should not install the switch on sheetrock or similar material. Sheetrock might not be strong enough to safely support the device.
- The site should allow for easy access to the ports on the front of the device, so that you can easily connect and disconnect cables, and view the port LEDs.
- The DC power source should be located near the device and be easily accessible.
- The site should not expose the device to moisture or water.
- The site should be a dust-free environment.
- Do not place objects on top of the switch.
- When installing the device in an enclosure, verify that the enclosure has adequate airflow so that the unit does not overheat.
- Select an enclosure that is large enough for the switch, DC power supply, and all other included equipment.

- The site should allow for adequate air flow around and through the cooling fins on the sides of the switch. The following minimum open spaces around the switch are recommended:
  - Two inches (5.08cm) under and above the switch.
  - Two inches (5.08cm) in front of the switch.
  - Two inches (5.08cm) on the left and right sides of the switch.
- The enclosure size must be determined by considering multiple factors, including the outside ambient temperature, total heat generated by the installed equipment, sealed or unsealed enclosure type, enclosure material, paint color, mounting method (wall, pole, ground, etc.), and sun load. The smaller enclosure size you choose, the higher the risk of overheating.

  If the product overheats in an enclosure that was built without taking into account these factors, the warranty of the product might be voided. Consult Allied Telesis when assistance is needed.
- The enclosure BTU/hour rating must be higher than the total BTU/hour values of equipment installed in the enclosure, over the expected operating temperature range. For the operating temperature ratings, refer to Table 19 on page 130. For heat dissipation, refer to Table 24 on page 132.
- The switch's maximum operating temperature depends on its orientation on the wall and the type of enclosure. Allied Telesis recommends installing the device vertically for best possible ventilation and cooling.
- If you install the switch in an metal enclosure, be sure to review the manufacturer's installation guide for rules and restrictions on site requirements, and to follow all guidelines and safety warnings.
- The switch and DC power source must be installed close to each other so that the DC power cables are kept as short as possible to minimize voltage loss.
- Before installing the DC power supply, be sure to review the manufacturer's installation guide for rules and restrictions on site requirements, and to follow all guidelines and safety warnings.
- The site should include dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- The switch and power supply must be properly connected to a protective earth ground.
- The switch and power supply must be individually grounded to the grounding conductor. Do not daisy-chain the ground wires.

- If you install the switch in a metal enclosure, the enclosure must be properly grounded to a protective earth ground following local electrical codes and the instructions in the manufacturer’s installation guide.
- Powered devices connected to the LAN ports on the switch must be grounded to the same grounding conductor at the service entrance as the switch.
- LAN ports should have additional lightning protections as specified in 802.3at standard, Section 33.4.1.1.2, Environment B Requirements, when connected to powered devices that are not grounded to the same grounding conductor at the service entrance as the switch.
- Electromagnetic interference might occur between switches and other devices when multiple switches are powered by a single DC power supply. This can be addressed by installing clamp-on ferrite beads on the DC power cables, between the DC power supply and switches.
- Recommendations for ground resistivity are given in Table 10.

Table 10. Ground Resistivity Recommendations

Level	Recommendation
Best Practice	<5 ohms
Acceptable	5 to 15 ohms
Marginal	15 to 25 ohms
Non-compliant	>25 ohms

- The copper cabling should not be exposed to sources of electrical noise, such as radio transmitters, broadband amplifiers, power lines, electric motors, and fluorescent lights.
- Allied Telesis recommends using CAT6 STP or UTP for LAN ports. These cables provide higher protection from radio frequency interference.
- Outdoor installation requires adequate electromagnetic immunity due to the higher thread-level conditions. For guidelines, refer to “Installing the Switch in an Outdoor Environment” on page 85.
- The narrow spacing between SFP transceiver slots and adjacent copper ports can make it difficult to connect and disconnect cables. Refer to Figure 16 on page 62. Allied Telesis recommends installing and cabling SFP slots before cabling adjacent copper ports. You might need to use a flat tool to disconnect cables.

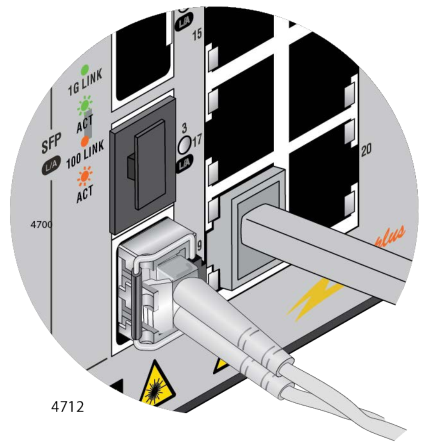


Figure 16. Spacing Between SFP Module and Copper Port

Unpacking the Product Package

To unpack the product package, perform the following procedure:

1. Remove all the components from the shipping box. Refer to Figure 17.

> **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.

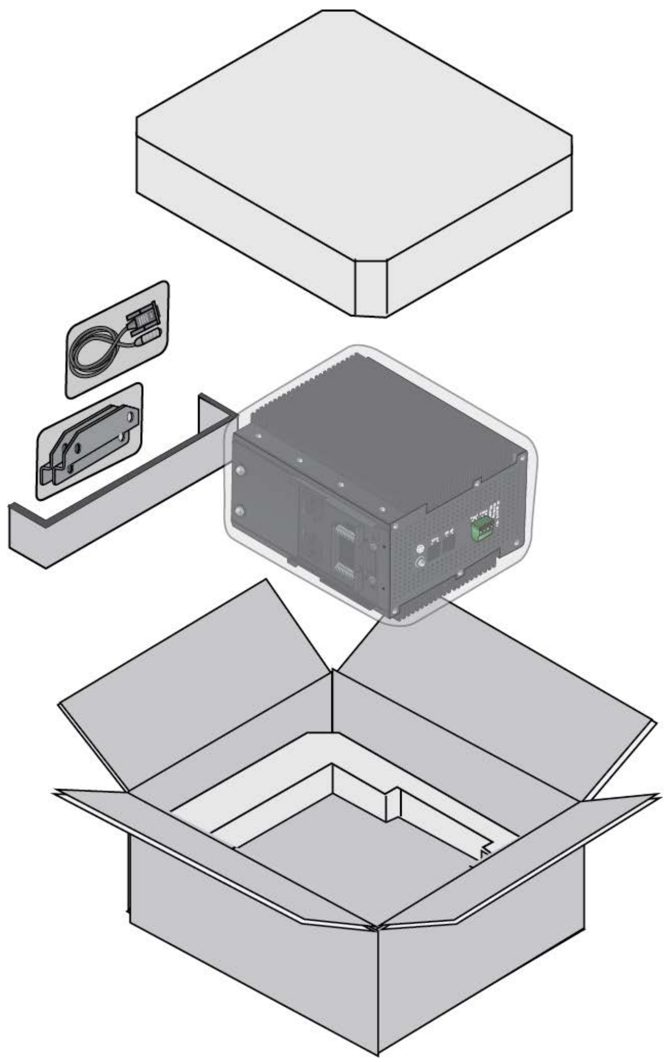


Figure 17. Removing the Switch from the Shipping Box

2. Remove the switch from the anti-static bag and place it on a level, secure surface. Refer to Figure 18.

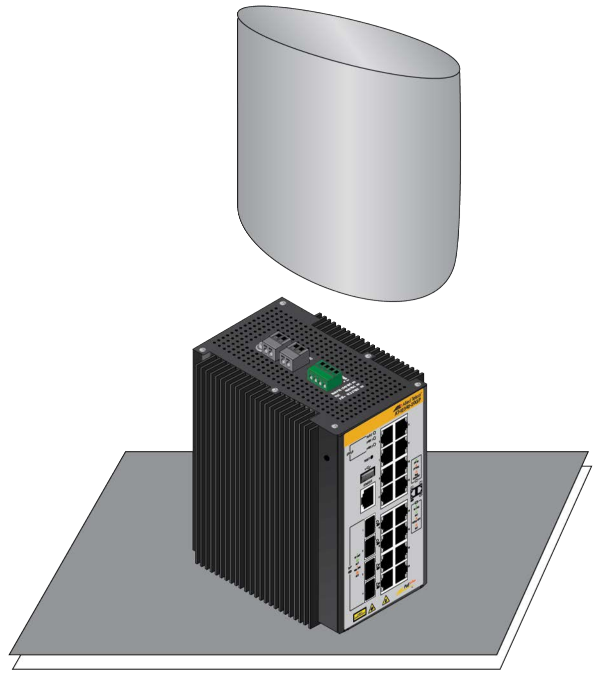


Figure 18. Removing the Switch from the Anti-static Bag

3. Verify that the shipping container includes the items shown in Table 11 on page 65.

   Figure 19 on page 65 identifies the pre-installed components of the IE340-20GP Switch as an example.

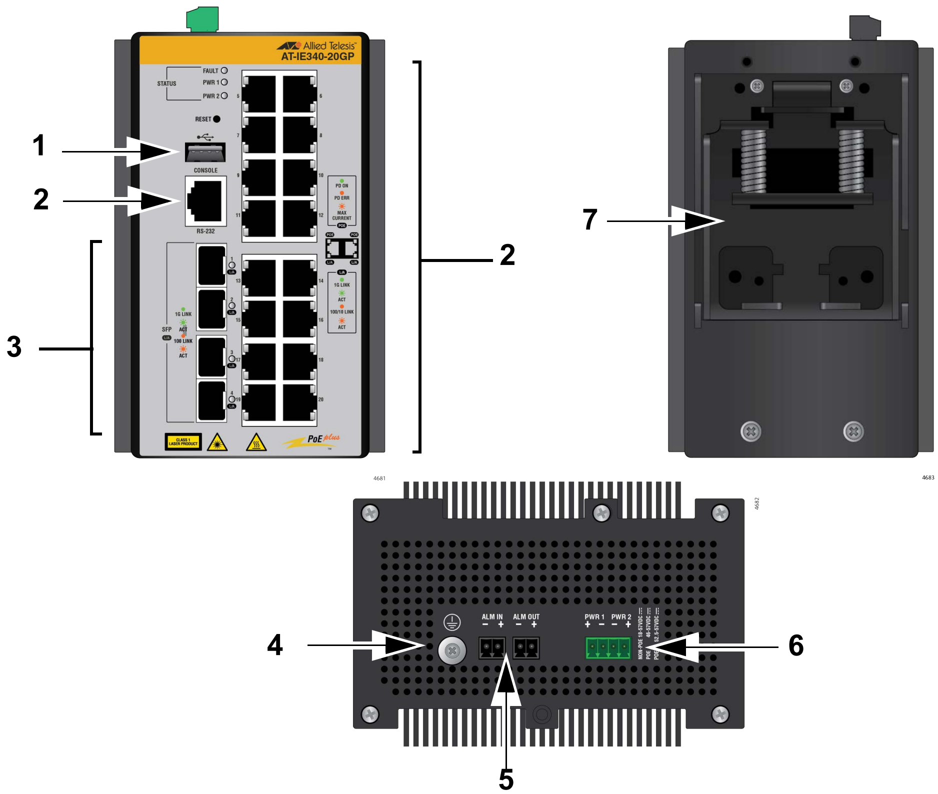


Figure 19. Pre-installed Components

Table 11 lists the pre-installed components.

Table 11. Pre-installed Components

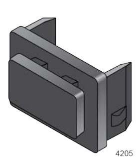
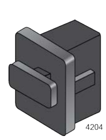
	Shipping Component		IE340-12GP IE340-12GT	IE340-20GP	IE340L-18GP
			Number of the Components		
1		Dust cover on the USB port (Pre-installed)	1	1	N/A
2		Dust covers on the copper and Console ports (Pre-installed)	9	17	17

Table 11. Pre-installed Components (Continued)

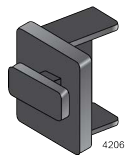
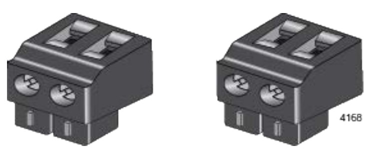
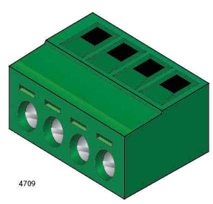
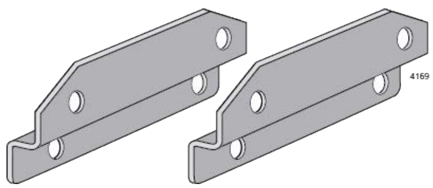
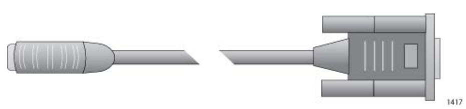
	Shipping Component		IE340-12GP IE340-12GT	IE340-20GP	IE340L-18GP
			Number of the Components		
3		Dust covers on the SFP slots (Pre-installed)	4	4	2
4		M4x8 Phillips-head grounding screw (Pre-installed)	1	1	1
5		2-pin connectors on the ALM IN and ALM OUT connectors (Pre-installed)	2	2	2
6		4-pin connector on the DC power PWR 1 and PWR 2 connectors (Pre-installed)	1	1	1
7		DIN rail bracket (Pre-installed)	1	1	1

Table 12 lists the contents of the accessory kit.

Table 12. Accessory Kit Contents

Accessory Kit Item		**IE340-12GP IE340-12GT**	**IE340- 20GP**	**IE340L- 18GP**
		Number of the Components		
	Wall bracket	2	2	2
	M4x8 Phillips-head screws (one screw for spare)	5	5	5
	2m (6.6ft) local management cable with RJ-45 (8P8C) and DB0 (D-sub 9-pin) connectors	1	1	1

Tools and Material

Table 13 lists the tools and material for the installation.

Table 13. Tools and Material

Component	Item
Ground wire	❒ One solid ground wire (recommended #16 AWG solid wire) ❒ One heat-shrink tube ❒ Ring-terminal lug
Power wires	❒ Two or four stranded power wires (recommended 18 AWG stranded wire. Do not use wire heavier than 16 AWG). ❒ One or two 2-wire connectors to connect the power wires to the AC/DC rectifiers or UPS units.
Alarm devices (optional)	❒ External sensor for the Alarm In (ALM IN) connector and/or external alert device for the Alarm Out (ALM OUT) connector. ❒ 24 to 18 AWG stranded wire properly rated for the installation site, maximum length of two meters.
DIN rail installation	❒ 35 x 7.5mm DIN rail ❒ Two DIN rail end clamps (optional)
Wooden wall installation	❒ Plywood base (optional) ❒ Four wall screws (The screw holes in the wall brackets have a diameter of 4.5 mm (0.17 in.)).
Concrete wall installation	❒ Four wall anchors and screws
Outdoor installation	❒ UL-listed Type 3X or 4X enclosure (Refer to "Installing the Switch in an Outdoor Environment" on page 85 for details.)

Table 13. Tools and Material (Continued)

Component	Item
Tools	❒ #1 flat-head screwdriver ❒ Phillips-head screwdriver ❒ Wire insulator stripper ❒ Wire crimper tool ❒ Heating device for the heat-shrink tube ❒ Stud finder for identifying the middle of wall studs and hot electrical wiring (wooden wall installation) ❒ Drill with 1/4” carbide drill bit (concrete wall installation)

Recording the Serial Number and MAC Address

The serial number and MAC address of the switch are located on labels on the back panel, as shown in Figure 20. If you need to record the numbers for your records, you should do so before installing the device.

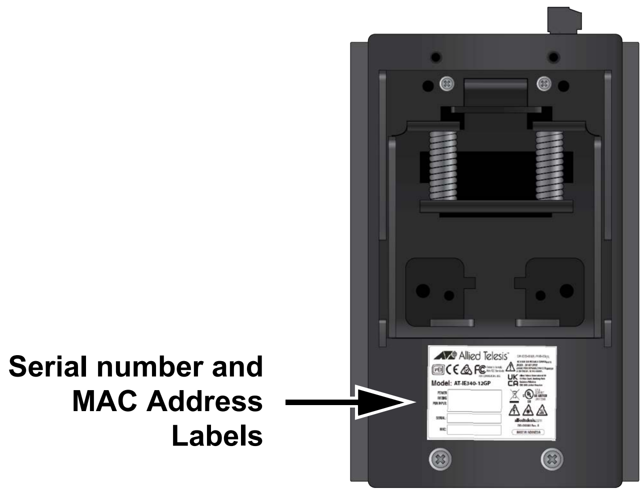


Figure 20. Serial Number and MAC Address Labels

Note
You can also view the serial number and MAC address of the switch with the SHOW SYSTEM SERIALNUMBER and SHOW SYSTEM MAC commands in the User Exec and Privileged Exec modes of the AlliedWare Plus management software.

Chapter 3

Installing the Switch

The procedures in this chapter are listed here:

Installing the Switch on a DIN Rail

The switch comes with a DIN rail bracket pre-installed on the back panel. The bracket is compatible with DIN 35 x 7.5mm rails. Figure 21 shows the switch installed on a DIN rail.

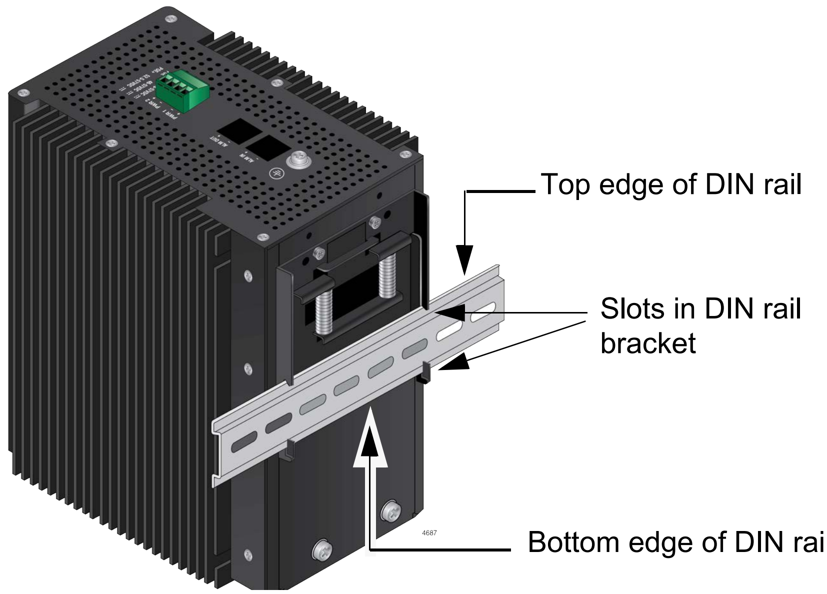


Figure 21. The Switch Installed on a DIN Rail

Figure 22 shows the correct vertical orientation of the switch on a DIN rail. Do not install the switch horizontally or upside-down.

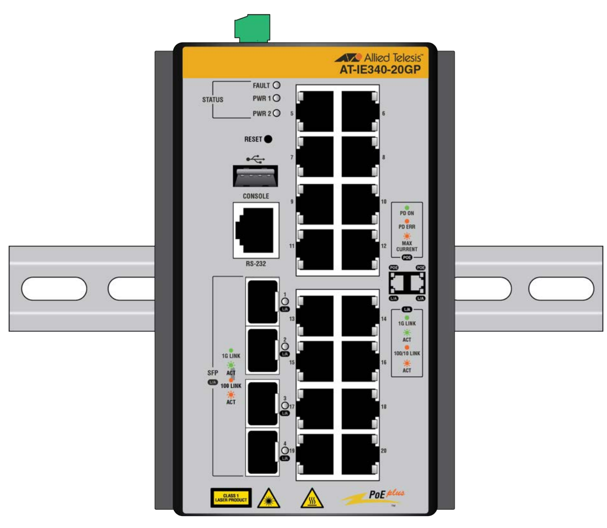


Figure 22. Vertical Orientation of the Switch on a DIN Rail

To install the switch on a DIN rail, perform the following procedure:

1. Hold the switch vertically with both hands, with the back panel next to the DIN rail on the wall.

2. Hook the bottom flange on the DIN rail into the bottom slot on the DIN rail bracket on the switch. Refer to Figure 23.

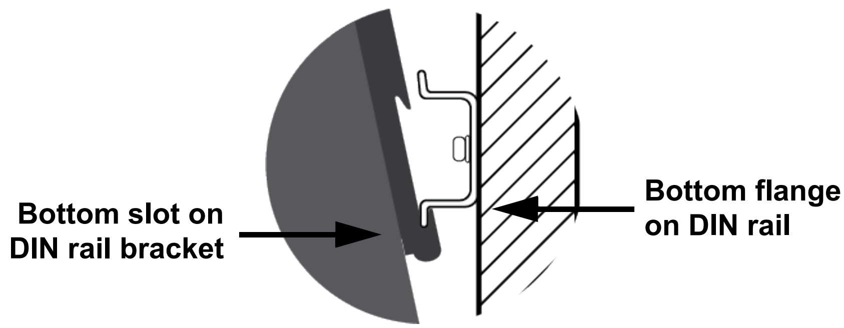


Figure 23. Installing the Switch on a DIN Rail - 1

3. Press upwards on the bottom panel of the switch to compress the springs in the DIN rail bracket, and pivot the switch until vertical. Refer to Figure 24.

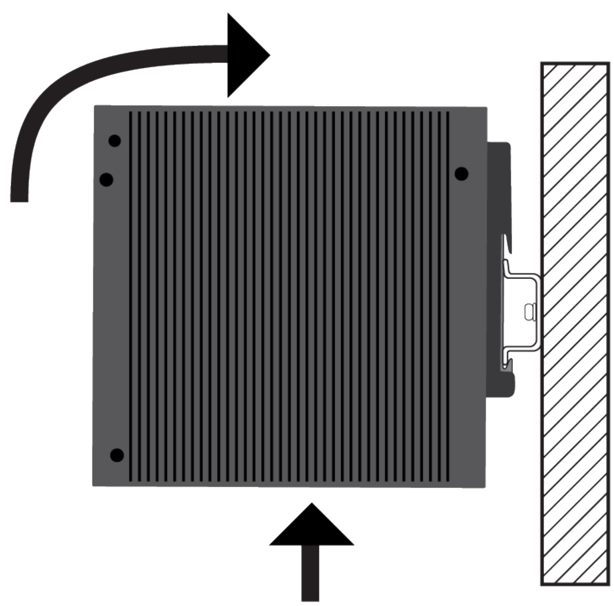


Figure 24. Installing the Switch on a DIN Rail - 2

4. Carefully lower the switch until that the top flange on the DIN rail fits into the top slot of the DIN rail bracket. Refer to Figure 25.

Figure 25. Installing the Switch on a DIN Rail - 3

5. Visually inspect the bracket to confirm that the DIN rail is now fitted into the top and bottom slots of the bracket, on both the left and right sides. Refer to Figure 26.

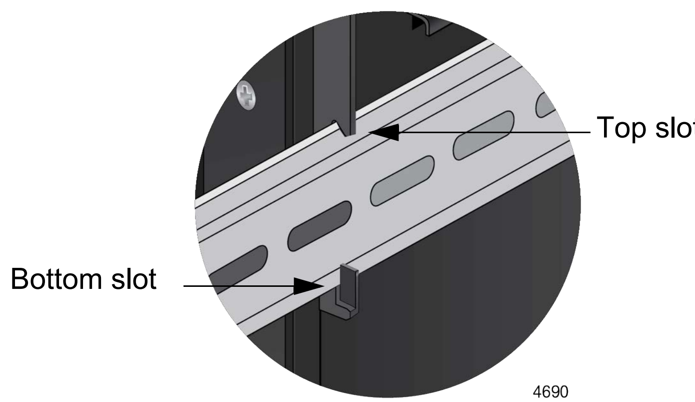


Figure 26. Verifying the DIN Rail Installation

Note
Allied Telesis recommends installing DIN rail end clamps to the sides of the switch to prevent damage or network traffic loss from vibration or shock. End clamps are not available from Allied Telesis.

6. Go to Chapter 4, “Cabling the Copper and SFP Ports” on page 89.

Installing the Switch on an Indoor Wooden Wall

This section contains the procedure for installing the switch on a wooden wall in a protected, indoor environment.

Note
The switch does not require an enclosure when installed in most indoor environments.

Note
The IE340-12GP, IE340-12GT, and IE340-20GP Switches must be installed in a UL Listed or Nationally Recognized Test Lab enclosure when used in a Measurement, Control, or Laboratory indoor environment, as specified in UL/EN/IEC 61010-1 and 61010-2-201.

Note
The IE340L-18GP Switch is not compliant with UL/EN/IEC 61010-1 and 61010-2-201 and must not be installed in a Measurement, Control, or Laboratory environment.

Warning
The IE048-480 Power Supply and other non-compliant UL/EN/IEC 61010-1 and 61010-2-201 power supplies must be installed in fire protection enclosures when installed on walls of combustible material (e.g., wood). Additionally, the floor area directly below the power supply should be non-combustible (e.g., metal or concrete) and be free of combustible material (e.g., paper, plastic, or wood).

Warning
The device should be installed on the wall by a qualified building contractor. Serious injury to yourself or others or damage to the equipment may result if it is not properly fastened to the wall. E105

Allied Telesis recommends using a plywood base when installing the switch on a wall with wooden studs. The base allows you to mount the device on two studs in the wall. (A plywood base is not required for a concrete wall.) Refer to Figure 27 on page 76.

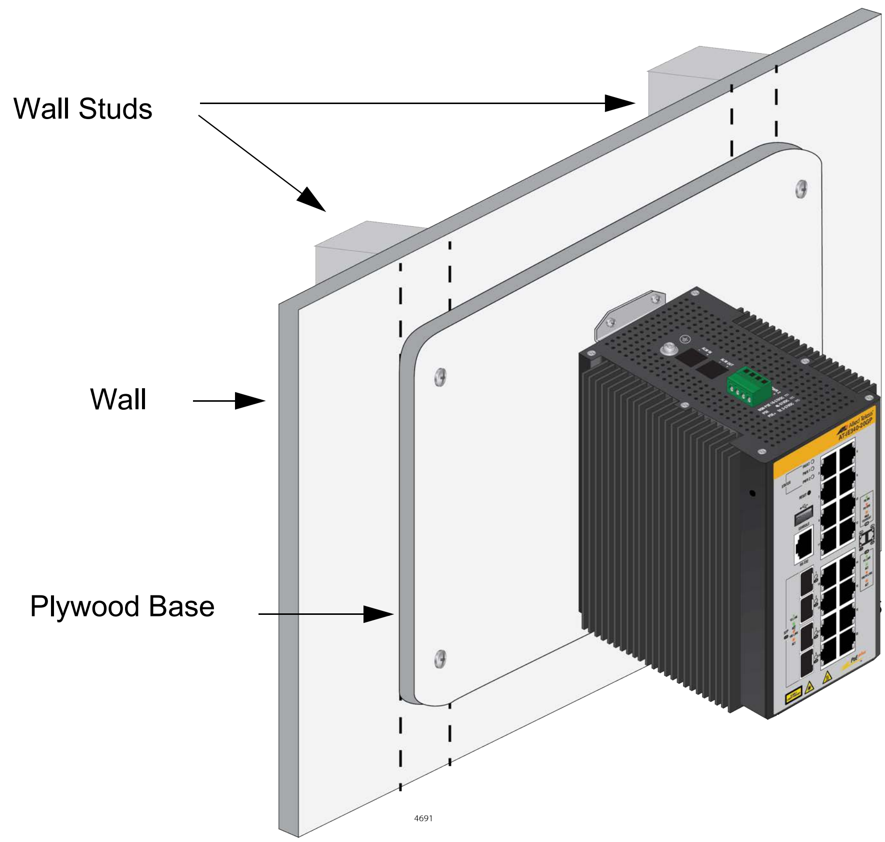


Figure 27. Switch on the Wall with a Plywood Base

The recommended minimum dimensions of the plywood base are listed here:

- Width: 58.4 centimeters (23 inches)
- Height: 28.0 centimeters (11 inches)
- Thickness: 2.6 centimeters (1 inch)

The dimensions assume the wall studs are 41 centimeters (16 inches) apart, the industry standard. You may need to adjust the width of the base if the distance between the studs in your wall is different than the standard.

You should install the plywood base to the wall first and then install the switch on the base. Refer to Figure 28 on page 77.

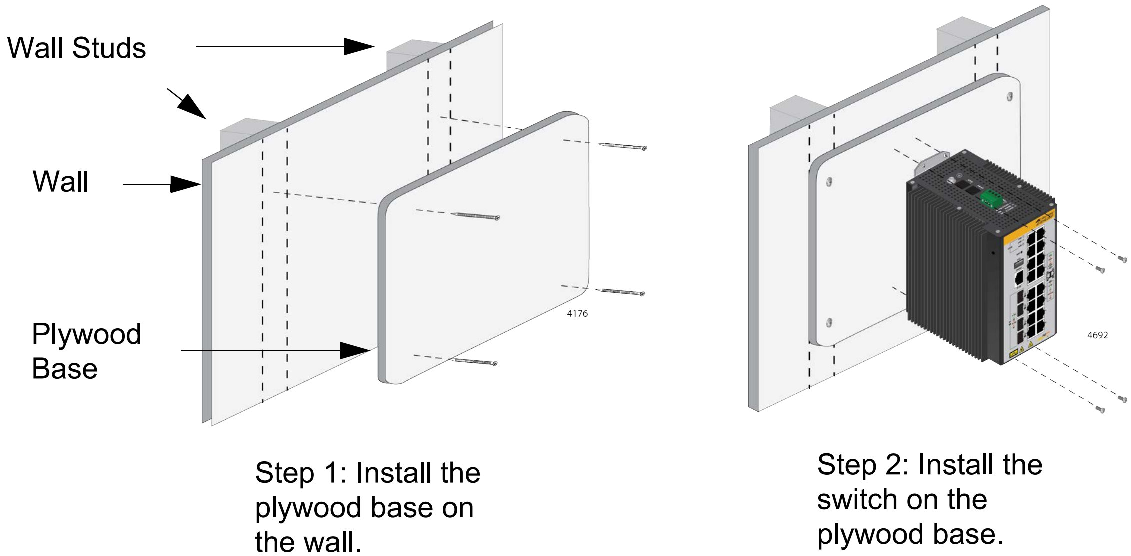


Figure 28. Steps to Installing the Switch with a Plywood Base

Tools and Material

Here are the tools and material required for installing the switch on a wooden wall:

- Two wall brackets (included with the switch)
- Four bracket screws (included with the switch)
- Cross-head screwdriver (not provided)
- Stud finder capable of identifying the middle of wall studs and hot electrical wiring (not provided)
- Plywood base (not provided)
- Four wall screws for attaching the switch to the plywood base (not provided). The diameter of the screw holes in the wall brackets is 4.5 mm (0.17 in.).
- Four screws and anchors for attaching the plywood base to the wall (not provided)

Installing the Plywood Base

A plywood base is recommended when installing the switch on a wall that has wooden studs. Consult a qualified building contractor for installation instructions for the plywood base. The installation guidelines are listed here:

- You should use a stud finder to identify the middle of studs and hot electrical wiring in the wall.
- You should attach the base to two wall studs with a minimum of four screws.
- The selected wall location for the base should adhere to the recommendations in “Reviewing Site Requirements” on page 59.

Installing the Switch on the Plywood Base

This procedure assumes that the plywood base for the switch is installed on the wall. Please review “Reviewing Safety Precautions” on page 54 and “Reviewing Site Requirements” on page 59 before performing this procedure.

Warning
The device is heavy. Always ask for assistance before moving or lifting it to avoid injuring yourself or damaging the equipment.
E122

To install the switch on the plywood base, perform the following procedure:

1. Place the switch on a table.

2. With a Phillips-head screwdriver, remove the four screws holding the pre-installed DIN rail bracket, and remove the bracket. Refer to Figure 29.

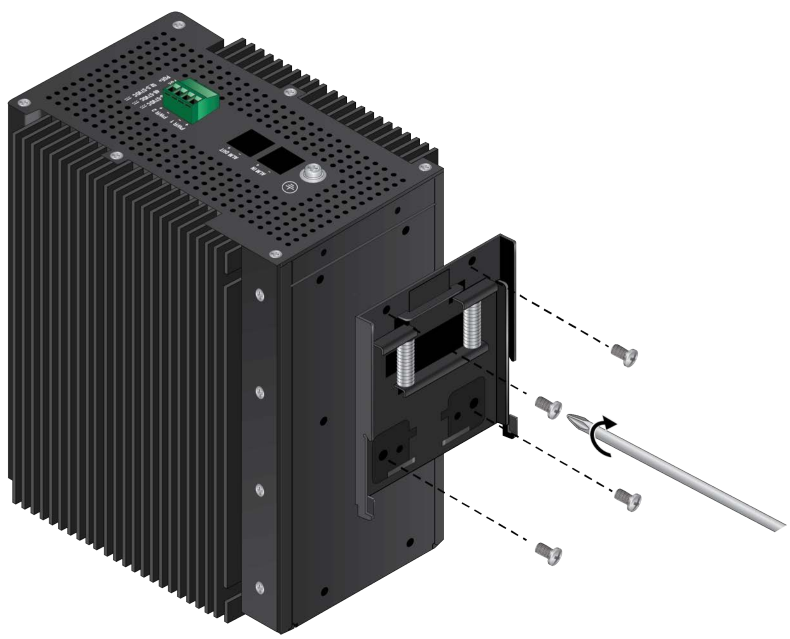


Figure 29. Removing the DIN Rail Bracket from the Switch

3. Remove the four screws from the top and bottom of the back panel. Refer to Figure 30.

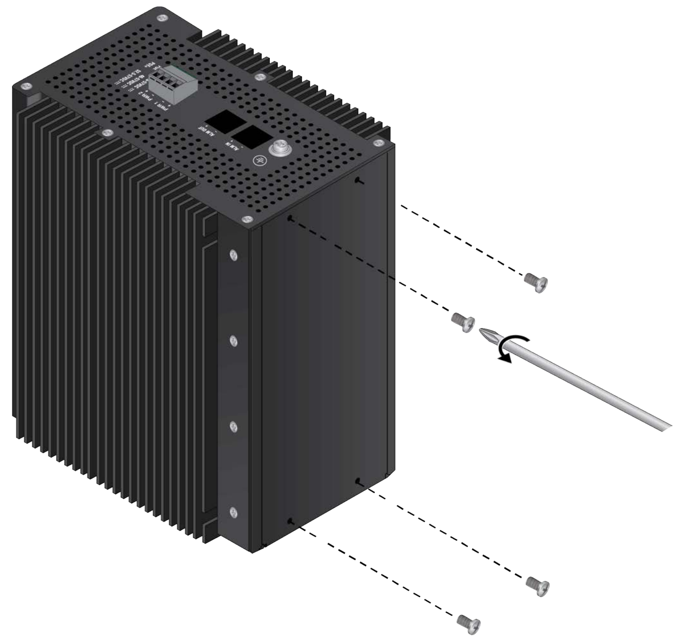


Figure 30. Removing the Four Screws from the Back Panel

4. Install the two wall brackets to the back panel of the switch, with the four screws included with the unit. Refer to Figure 31.

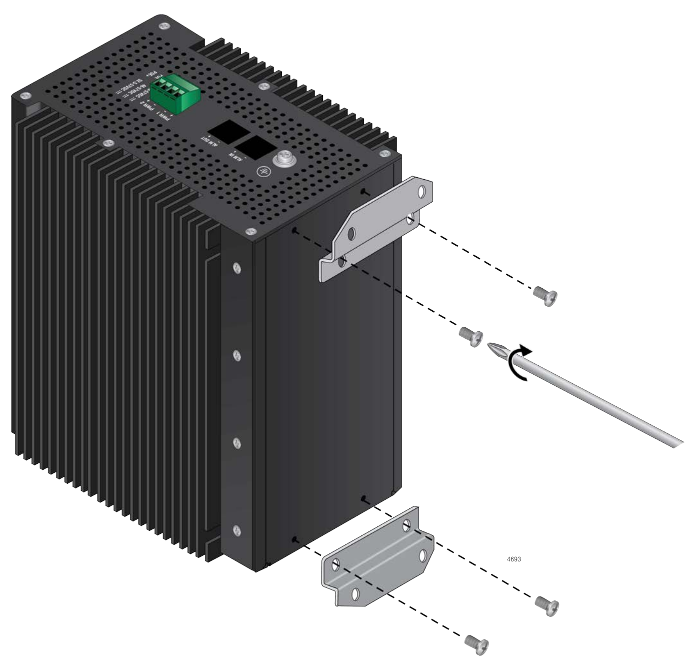


Figure 31. Installing the Wall Brackets on the Switch

5. Have another person hold the switch on the plywood base on the wall while you secure it with four screws (not provided). Refer to Figure 32.

   Please follow these guidelines as you position the switch on the wall:

   - The switch must be oriented as shown in Figure 32. Do not install the switch horizontally or upside-down.
   - Be sure to leave sufficient space from other devices or walls to allow for adequate air circulation around and through the cooling fins. Refer to “Reviewing Site Requirements” on page 59 for further information.

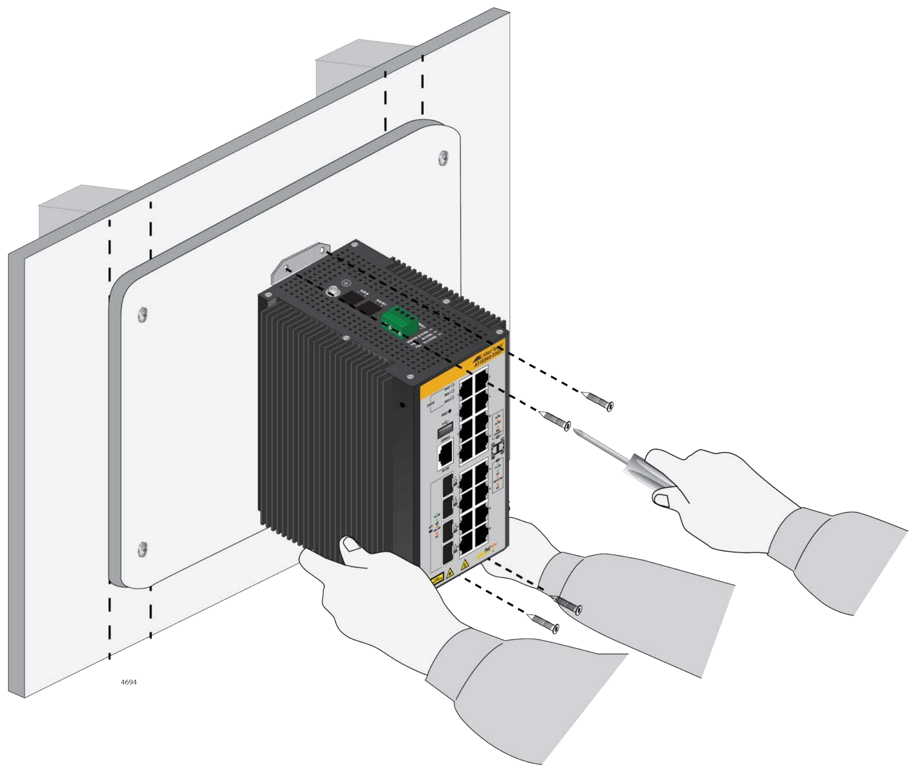


Figure 32. Attaching the Switch to the Plywood Base

6. Go to Chapter 4, “Cabling the Copper and SFP Ports” on page 89.

Installing the Switch on an Indoor Concrete Wall

This section contains the procedure for installing the switch on a concrete wall in a protected, indoor environment.

Note
The switch does not require an enclosure when installed in most indoor environments.

Note
The switch must be installed in a UL Listed or Nationally Recognized Test Lab enclosure when used in a Measurement, Control, or Laboratory indoor environment, as specified in UL/EN/IEC 61010-1 and 61010-2-201.

Note
The IE340L-18GP Switch is not compliant with UL/EN/IEC 61010-1 and 61010-2-201 and must not be installed in a Measurement, Control, or Laboratory environment.

Warning
The IE048-480 Power Supply and other non-compliant UL/EN/IEC 61010-1 and 61010-2-201 power supplies must be installed in fire protection enclosures when installed on walls of combustible material (e.g., wood). Additionally, the floor area directly below the power supply should be non-combustible (e.g., metal or concrete) and be free of combustible material (e.g., paper, plastic, or wood).

This section contains instructions on how to install the switch on a concrete wall.

Warning
The device is heavy. Always ask for assistance before moving or lifting it to avoid injuring yourself or damaging the equipment.
E122

Warning
The device should be installed by a qualified building contractor. Serious injury to yourself or others or damage to the equipment may result if it is not properly fastened to the wall. E105

Here are the tools and material required for installing the switch on a concrete wall:

- Two wall brackets (included with the switch)
- Four bracket screws (included with the switch)
- Four wall screws (not provided)
- Cross-head screwdriver (not provided)
- Drill and 1/4” carbide drill bit (not provided)
- Four anchors and screws for attaching the switch to the wall (not provided). The diameter of the screw holes in the wall brackets is 4.5 mm (0.17 in.).

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

1. Place the switch in a table.
2. With a Phillips-head screwdriver, remove the four screws holding the pre-installed DIN rail bracket, and remove the bracket. Refer to Figure 29 on page 78.
3. Remove the four screws from the top and bottom of the back panel. Refer to Figure 30 on page 79.
4. Install the two brackets that come with the switch to the back panel of the unit. Refer to Figure 31 on page 79.
5. Have a person hold the switch on the concrete wall at the selected location for the device while you use a pencil or pen to mark the wall with the locations of the four screw holes in the two wall brackets. Refer to Figure 33 on page 83.

   Please follow these guidelines as you position the switch on the wall:

   - The switch must be oriented as shown in Figure 33. You may not install the switch horizontally or upside-down.
   - Be sure to leave sufficient space from other devices or walls to allow for adequate air circulation around and through the cooling fins. Refer to “Reviewing Site Requirements” on page 59 for further information.

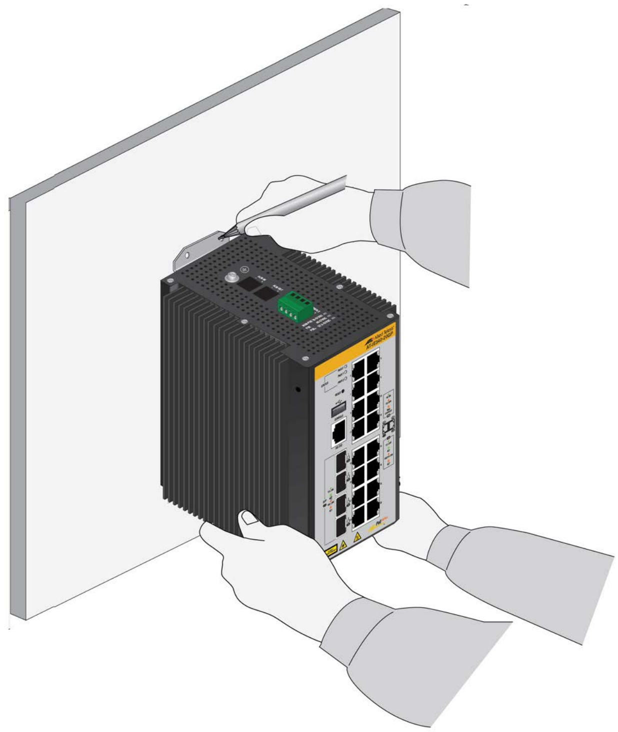


Figure 33. Marking the Locations of the Bracket Holes on a Concrete Wall

6. Place the switch on a table or desk.

7. Use a drill and 1/4” carbide drill bit to pre-drill the four holes you marked in step 3. Please review the following guidelines:

   - Prior to drilling, set the drill to hammer and rotation mode. The modes break up the concrete and clean out the hole.
   - Allied Telesis recommends cleaning out the holes with a brush or compressed air.

8. Insert four anchors (not provided) into the holes.

9. Have another person hold the switch at the selected wall location while you secure it with four screws (not provided). Refer to Figure 34 on page 84.

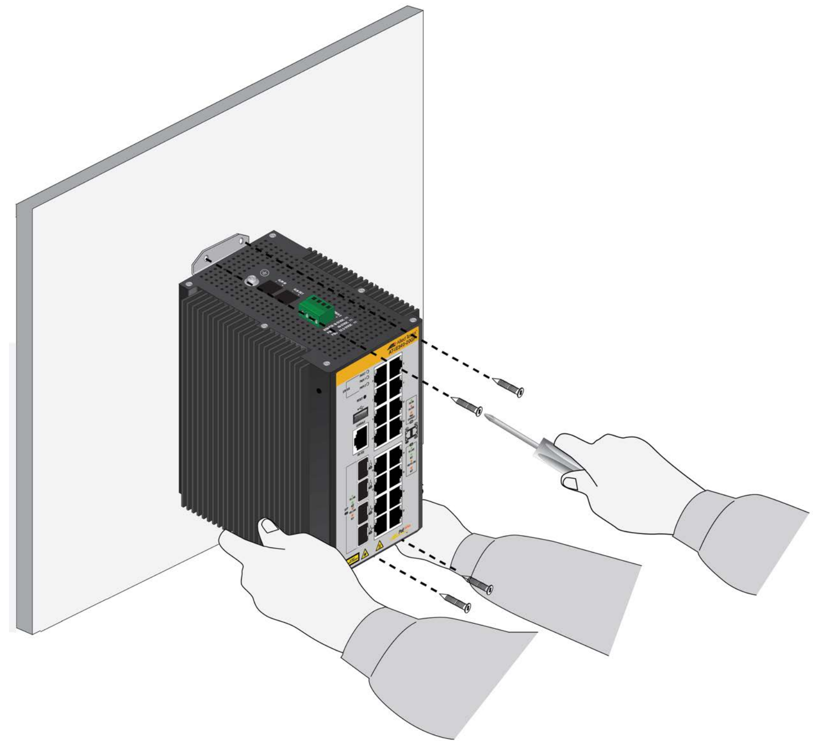


Figure 34. Installing the Switch on a Concrete Wall

10. Go to Chapter 4, “Cabling the Copper and SFP Ports” on page 89.

Installing the Switch in an Outdoor Environment

IE340 switches are suitable for outdoor environments when installed in enclosures rated for the environments. Refer to Table 14.

Table 14. Outdoor Environment Enclosures for the IE360 Switches

Region	Minimum Enclosure Rating
North America	NEMA or CSA Type 3 or higher
European Union	ATEX IP54 or higher

Caution
The switches must be installed in enclosures when installed in outdoor environments. The enclosures must be rated as meeting or exceeding the requirements of the outdoor environments.

Requirements for Outdoor Installation

Here are the requirements:

- Follow the enclosure manufacturers installation recommendations to maintain safety and protection from outdoor environment.
- Verify that the enclosure BTU/hour rating is higher than the total BTU/hour values of equipment installed in the enclosure over the expected operating temperature range. For the operating temperature ranges, see “Environmental Specifications” on page 130.
- The enclosure size and whether it is sealed or ventilated must be determined by considering several factors, which can include the following:
  - Total heat generated by the installed equipment
  - Enclosure material and paint color
  - Mounting method (wall, pole, ground, etc.)
  - Sun exposure

Caution
The smaller enclosure size you choose, the higher risk of the product overheating. If the product overheats in an enclosure that does not meet or exceed the requirements of the environment, the warranty of the product might be voided. Consult Allied Telesis when assistance is needed.

Immunity and Precautions

The IE340 Switches are suitable for industrial applications, which require electromagnetic compatibility (EMC) standards, such as EN 61000-6-2 for immunity and EN 61000-6-4 for interference.

The generic standard EN 61000-6-2 specifies the immunity test levels in relation to continuous and transient conducted and radiated disturbances. Tests within the standard include Electrostatic Discharges (ESD), Electrical Fast Transients (EFT), surge, Power Frequency Magnetic Fields, and power interruptions. These tests use the same detailed measurements and test methods used for the basic standard EN 61000-4-x series.

Equipment connected to outdoor cables may be exposed to surges, which can damage components and circuits.

The surge immunity level of IE340 Switches comply with IEC 61000-4-5 installation class 3, as follows:

> "Electrical environment where power and signal cables run in parallel.
>
> The installation is grounded to the common grounding system of the power installation, which can be subjected to interference voltages generated by the installation itself or by lightning.
>
> Current due to ground faults, switching operations and lightning in the power installation may generate interference voltages with relatively high amplitudes in the grounding system. Protected electronic equipment and less sensitive electric equipment are connected to the same power supply network. The interconnection cables can be partly outdoor cables, but close to the grounding network.
>
> Unsuppressed inductive loads are present in the installation and usually there is no separate of the different field cables.
>
> Surge may not exceed 2 kV.[1]"

If this condition is not satisfied, Allied Telesis strongly recommends installing primary surge protections, typically solid state or gas tube arrestors located at the point where the cables enter the building or outdoor cabinet.

Note
The requirements may not be sufficient to protect against damages in extreme environments and in cases such as close or direct lightning strikes.

---

1. IEC 61000-4-5:2014 @ IEC 2014

Lightning Protection Requirements

Lightning strikes the ground and follows the paths of least impedance to cause damages. To provide an effective lighting protection system, you must put the following fundamental measures in place:

- Surge protection device must be installed at every service entrance to stop the intrusion of lightning from outside.
- Bonding must be accommodated to eliminate the opportunity for lightning to side-flash internally. The bonding resistance between any termination point and the related earthing rod should not exceed 0.01 ohms.
- Grounding electrode system must efficiently move the lightning to its final destination away from the structure and its contents.The resistance of the common grounding electrode should not exceed 5 ohms.
- Cable conductors route lightning current over and through the construction, without damage, toward the grounding electrode system.
- To avoid interference problems, use CAT6 Shielded Twisted Pair (STP) cables to connect devices if a device, e.g. camera, is installed outdoors, or a network cable is routed outdoors.
- Avoid Ground Loop. STP cabling *must* be grounded on *one* side only. Failure to do so can lead Ground Loop, which is a condition created when a network has more than one ground point. Ground Loop causes a voltage difference between connected networking components. As a result, current loops can potentially damage the connected equipment.
- Use appropriate grounding. Systems without appropriate grounding can experience either complete system failures or intermittent problems that are hard to diagnose. Improper installation of electrical grounding components can make the components work ineffectively. Installing a system with the proper grounding equipment and following proper installation guidelines can reduce potential down time as well as costly repairs to system electronics.

Note
The users of the plant or those responsible for the installation should apply the necessary measures (e.g. shielding, bonding, and grounding protection) to ensure that the interference voltages caused by lighting strokes do not exceed the available immunity level.

Chapter 4

Cabling the Copper and SFP Ports

This chapter contains the following procedures:

Cabling the Copper Ports

Here are the guidelines to cabling the copper ports:

- The ports have 8-pin RJ45 connectors.
- The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.
- The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- The default speed setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have fixed speeds of 10M or 100M. For those switch ports, disable Auto-Negotiation and set the port’s speed manually to match the speeds of the network devices.
- Copper ports must be set to Auto-Negotiation, the default setting, to operate at 1G.
- The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- The default duplex mode setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have a fixed duplex mode. Disable Auto-Negotiation on those ports and set their duplex modes manually to avoid the possibility of duplex mode mismatches. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.
- The default wiring configuration of the ports is automatic MDIX detection, which configures the MDI/MDIX setting automatically. This setting is appropriate for switch ports that are connected to network devices that also support the feature.
- The default wiring configuration of automatic MDIX detection is not appropriate for ports that are connected to network devices that do not support the feature. On those ports, you should disable automatic MDIX detection and set the wiring configuration manually with the POLARITY command.

- The appropriate MDI/MDI-X setting for a switch port connected to a 10/100Base-T network device with a fixed wiring configuration depends on the setting of the network device and whether the switch and network device are connected with straight-through or crossover cable. If you are using straight-through copper cable, the wiring configurations of a port on the switch and a port on a network device must be opposite each other, such that one port uses MDI and the other MDI-X. For example, if a network device has a fixed wiring configuration of MDI, you must disable auto-MDI/MDI-X on the corresponding switch port and manually set it to MDI-X. If you are using crossover copper cable, the wiring configurations of a port on the switch and a port on a network device must be the same.
- Do not attach cables to ports of static or LACP port trunks until after configuring the switch trunks. This is to prevent the ports rom forming network loops that can adversely affect network performance.
- PoE is enabled by default on the copper ports on the IE340 PoE Switches.
- Ethernet cables that are connected to outdoor equipment, such as CCTVs mounted on poles, might be subjected to surges from lightning or power cross events. Properly rated primary protection devices must be installed on the cables before connecting them to the switch. Refer to “Installing the Switch in an Outdoor Environment” on page 85.
- The narrow spacing between SFP transceiver slots and adjacent copper ports can make it difficult to connect and disconnect cables. Refer to Figure 16 on page 62. Allied Telesis recommends installing and cabling SFP slots before cabling adjacent copper ports. You might need to use a flat tool to disconnect cables.

Installing SFP Transceivers

Please review the following guidelines before installing SFP transceivers:

- SFP transceivers are hot-swappable. You may install them while the device is powered on.
- For a list of supported transceivers, refer to the product data sheet.
- The operational specifications and fiber optic cable requirements of the transceivers are provided in the documents included with the devices.
- You should install a transceiver before connecting its fiber optic cable.
- Fiber optic transceivers are dust sensitive. Always keep the plug in the optical bores when a fiber optic cable is not installed, or when you store the transceiver. When you do remove the plug, keep it for future use.
- Unnecessary removal and insertion of a transceiver can lead to premature failure.
- The narrow spacing between SFP transceiver slots and adjacent copper ports can make it difficult to connect and disconnect cables. Refer to Figure 16 on page 62. Allied Telesis recommends installing and cabling SFP slots before cabling adjacent copper ports. You might need to use a flat tool to disconnect cables.

Warning
A transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an anti-static wrist strap, to avoid damaging the device. E86

The illustrations in the following procedure show a transceiver with a duplex LC connector. The connectors on your transceivers may be different.

To install SFP transceivers in the chassis, perform the following procedure:

1. Remove the dust plug from a transceiver slot. Figure 35 on page 93 shows the dust plug removed from slot 1.

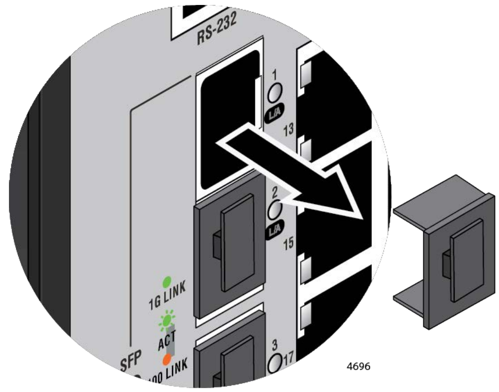


Figure 35. Removing the Dust Plug from an SFP Slot

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.

3. Position the transceiver with its handle on the right and slide it into the slot until it clicks into place. Refer to Figure 36.

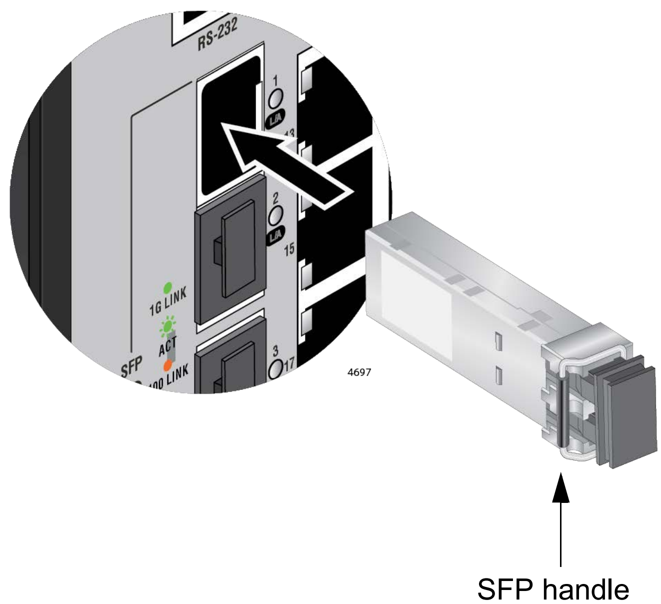


Figure 36. Installing an SFP Transceiver

Note
If you are ready to attach the fiber optic cable to the transceiver, continue with the next step. Otherwise, repeat steps 1 to 3 to install the remaining transceivers in the switch.

---

4. Remove the dust cover from the transceiver. Refer to Figure 37.

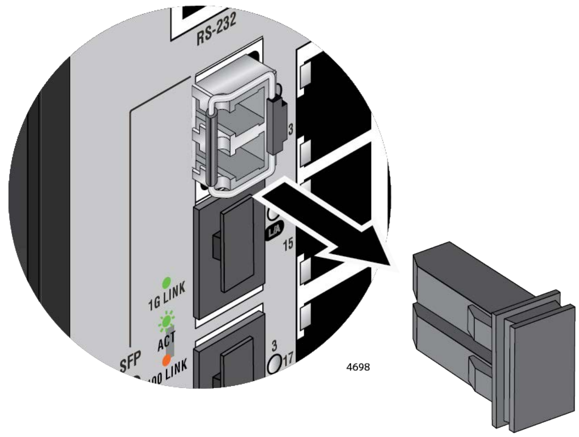


Figure 37. Removing the Dust Cover from an SFP Transceiver

5. Verify the handle on the transceiver is turned to the left. Refer to Figure 38.

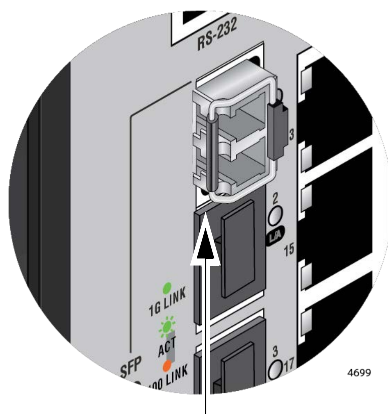


Figure 38. Verifying the Position of the SFP Handle

6. Connect the fiber optic cable to the transceiver. The connector on the cable should fit snugly into the port, and the tab should lock the connector into place. Refer to Figure 39 on page 95.

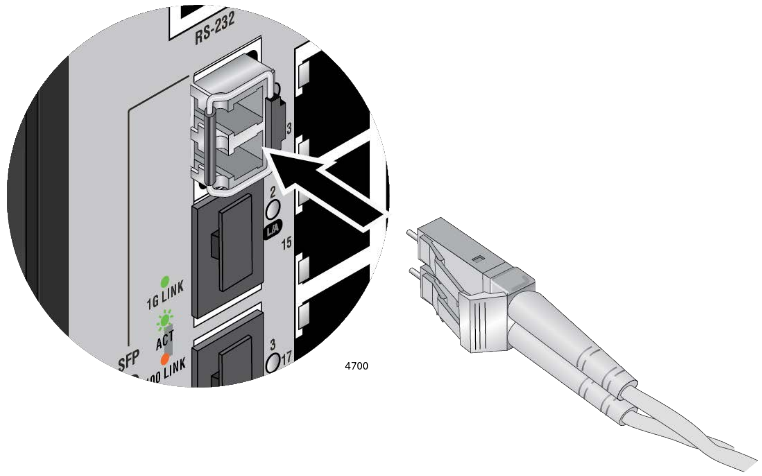


Figure 39. Connecting a Fiber Optic Cable to an SFP Transceiver

7. Repeat this procedure to install and cable the remaining transceivers.

8. Go to Chapter 5, “Powering On the Switch” on page 97.

Chapter 5
Powering On the Switch

This chapter contains the following procedures:

Connecting the Grounding Wire

Here are the guidelines for the grounding wire:

- The wire should be minimum #16 AWG solid wire.
- The wire length should be as short as possible.
- Continuity from the grounding screw to the earth ground must be less than 0.05 ohms.
- If a terminal is used, it should be double crimped.

Warning
This equipment must be earthed. The ground screw on the unit must be connected to a properly earthed bonding point. E120

To connect the grounding wire with bare wire, perform the following procedure:

1. Strip 2.54cm (1.0 in.) of insulation from the end of the solid grounding wire with a wire insulator stripper. Refer to Figure 40.

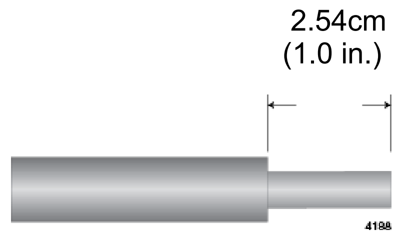


Figure 40. Stripping the Grounding Wire

Warning
Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. E10

2. Slide a heat-shrink tube over the grounding wire. Refer to Figure 41

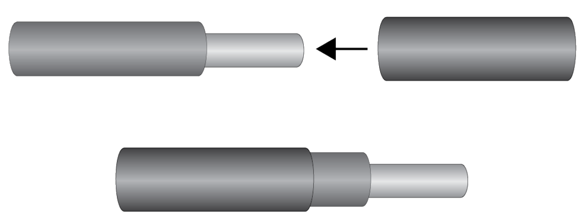


Figure 41. Sliding a Heat-shrink Tube Over the Grounding Wire

3. Slide the ring terminal lug over the stripped wire on the grounding wire. Refer to Figure 42.

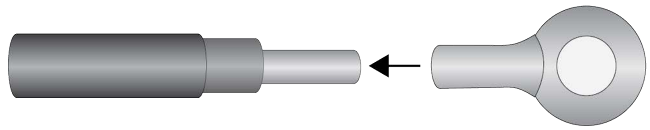


Figure 42. Sliding the Ring Terminal Lug on the Grounding Wire

4. Crimp the ring terminal lug with a wire crimping tool to secure it on the grounding wire. Refer to Figure 43.

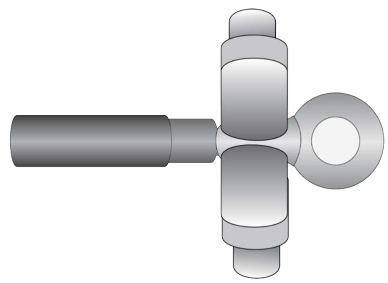


Figure 43. Crimping the Ring Terminal Lug

5. Slide the heat-shrink tube over the shaft of the ring terminal lug. Refer to Figure 44.

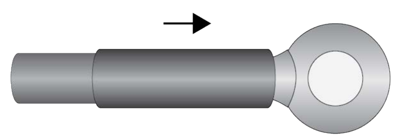


Figure 44. Sliding the Heat-Shrink Tube Over the Ring Terminal Lug

6. Heat the heat-shrink tube to secure it on the wire and ring terminal lug. Refer to Figure 45.

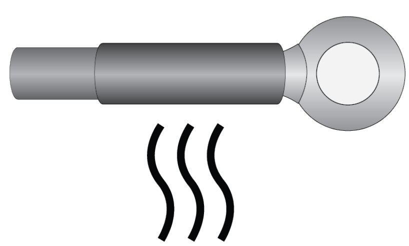


Figure 45. Heating the Heat-Shrink Tube

7. Remove the grounding screw from the switch with a #2 Phillips-head screwdriver. Refer to Figure 46.

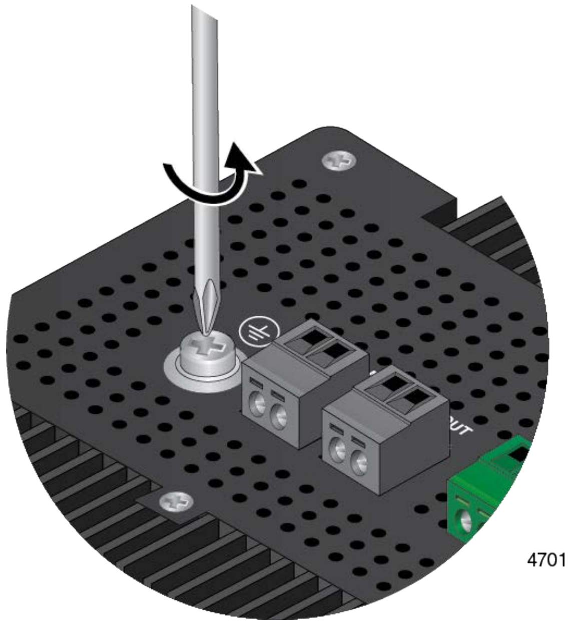


Figure 46. Loosening the Grounding Screw

8. Secure the grounding screw to the switch with the grounding screw. Refer to Figure 47.

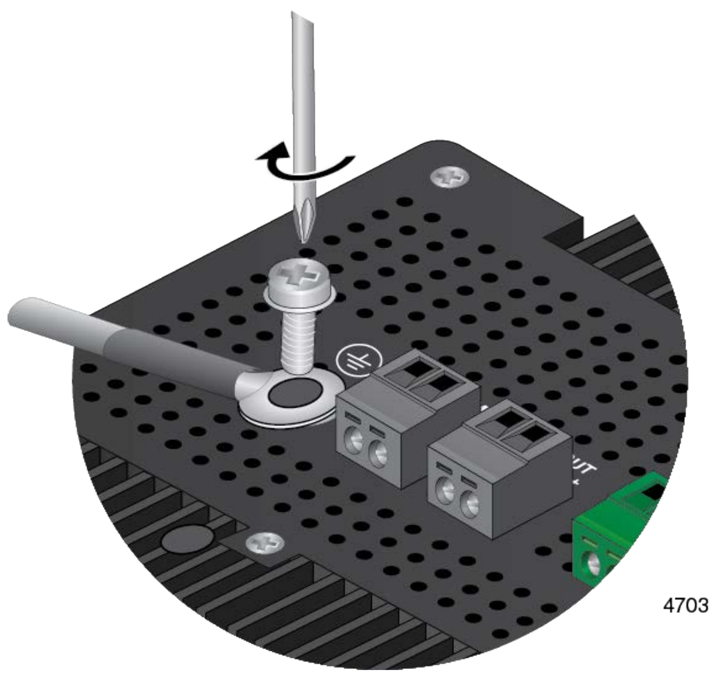


Figure 47. Attaching the Grounding Wire to the Switch

9. Connect the other end of the grounding wire to a ground point at the installation site.

10. Do one of the following:

    - To wire the alarm connectors, go to “Wiring the ALM IN and ALM OUT Connectors” on page 102.
    - Otherwise, go to “Preparing the DC Power Cables” on page 107.

Wiring the ALM IN and ALM OUT Connectors

For background information on the alarm connectors, refer to “Alarm In Connector” on page 45 and “Alarm Out Connector” on page 48. Here are general guidelines to the alarm connectors:

- Use 24 to 18 AWG stranded wire properly rated for the installation site.
- The maximum length of alarm cables is two meters.
- Alarm cables must be contained within the cabinet or building. Do not expose alarm cables to the outside environment.

The switch provides the voltage for the ALM IN circuit. Here are the requirements for the external sensor for the ALM IN connector:

- It must be a dry contact.
- It must not place any current on the circuit.
- It must not use the voltage or current from the switch on the circuit for its own operations.
- It must be able to handle a minimum of 3.3VDC and 320uA.

Caution
The external sensor might damage the Alarm In connector if it places a voltage on the circuit. E118

The switch does not provide voltage on the ALM OUT connector circuit. The external alert device has to provide the necessary power. Here are the power requirements for the ALM OUT connector:

- 30VDC maximum
- 0.5A maximum

Caution
The power from the external alert device must not exceed the above specifications. Otherwise, the Alarm Out connector circuit might be damaged. E123

Note
The ALM OUT connector can sync 0.5A at 30VDC maximum.You must provide a series resistance to limit current, if necessary.

Before wiring an alarm connector, familiarize yourself with the negative and positive polarities of its two pins by examining the legends on the top panel. Refer to Figure 48.

Figure 48. Polarity Legend for the Alarm Connectors

The following procedure shows the ALM OUT connector. The procedure is the same for the ALM IN connector. To wire an alarm connector, perform the following procedure:

1. Strip 6.5mm (0.25 in.) of insulation from the ends of the wires with a wire insulator stripper. Refer to Figure 49.

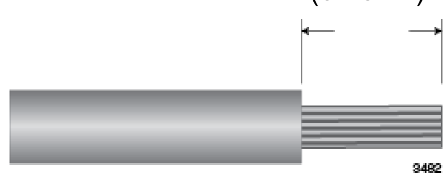


Figure 49. Stripping an Alarm Wire

Warning
Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. E10

2. Tightly wrap the wire strands with your finger tips. Refer to Figure 50 on page 104.

   This step is to prevent loose strands from touching other wires and causing an electrical short.

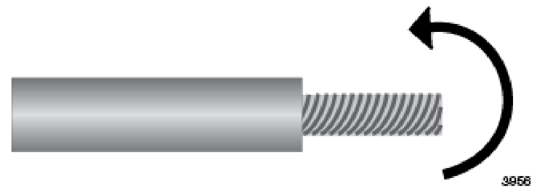


Figure 50. Wrapping the Wire Strands

Note
Allied Telesis recommends tinning the wires with solder for added protection against loose strands. This guide does not provide instructions on how to tin wires.

---

3. Remove the alarm connector from the top panel. Figure 51 shows the removal of the ALM OUT connector.

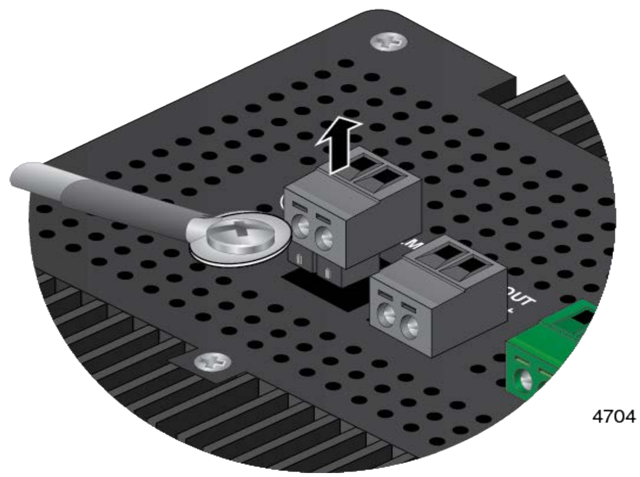


Figure 51. Removing an Alarm Connector

4. Loosen the wire retaining screws in the connector with a #1 screwdriver. Refer to Figure 52.

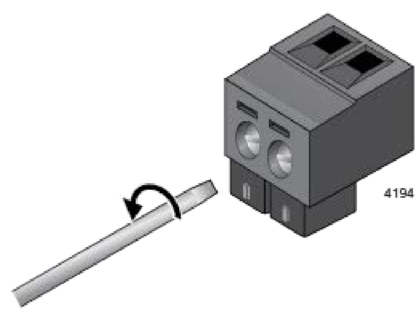


Figure 52. Loosening the Wire Retaining Screws on an Alarm Connector

5. Insert the wires into the connector and tighten the retaining screws to secure the wires. Refer to Figure 53.

   Allied Telesis recommends tightening the screws to 2 to 3 in.-lbs.

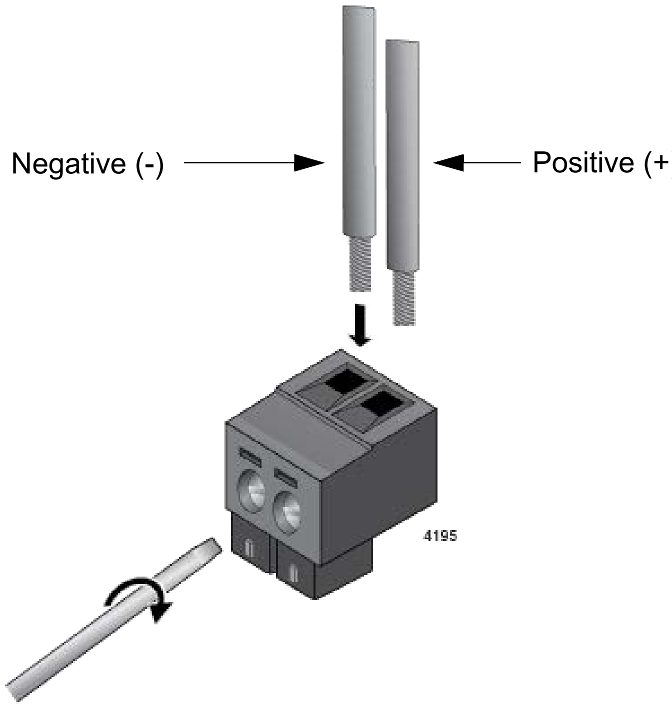


Figure 53. Inserting the Wires into the DC Cable Connector

6. After attaching the wires to the connector, verify that there are no exposed wires or loose wire strands. Refer to Figure 60 on page 110.

Warning
Check to see if there are any exposed copper strands coming from the installed wires. When this installation is done correctly there should be no exposed copper wire strands extending from the terminal block. Any exposed wiring can conduct harmful levels of electricity to persons touching the wires. E12

7. Insert the alarm connector back into its connector on the switch. Refer to Figure 54 on page 106.

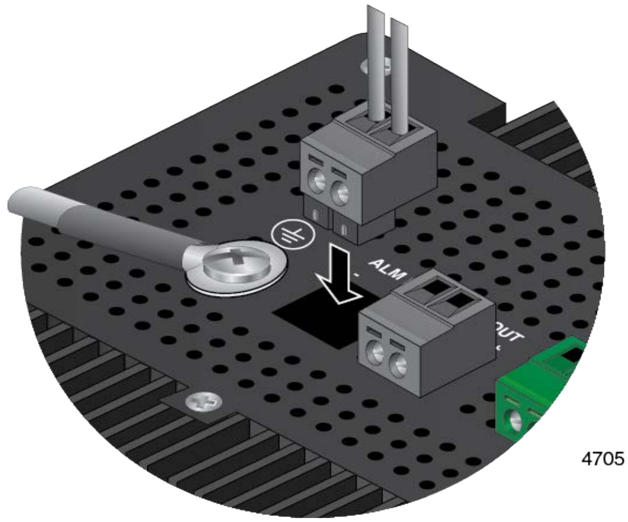


Figure 54. Inserting the DC Connector into the Alarm Connector

8. Connect the other end of the wires to an external sensor for the Alarm In connector or an alert device for the Alarm Out connector.

9. If necessary, repeat this procedure to wire the other alarm connector.

10. Go to “Preparing the DC Power Cables” on page 107.

Preparing the DC Power Cables

You can power the switch with either one or two DC power supplies. For power supply specifications, refer to “Switch DC Power Requirements” on page 50.

Power supplies are connected to the 4-wire, DC power connector on the top panel of the switch. Figure 55 shows the DC connector on the IE340-20GP switch as an example. A power supply is connected to the switch with two wires, one positive (+) and one negative (-). If you are installing only one power supply to the switch, you may connect it to either the PWR 1 or PWR 2 connector.

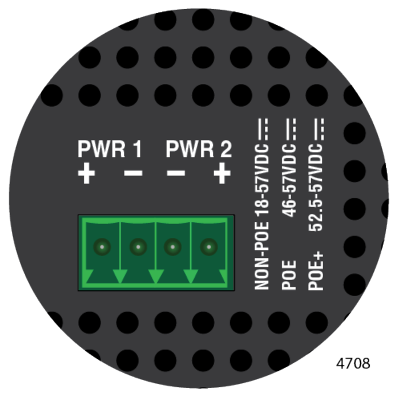


Figure 55. Pin Signals Legends for the PWR 1 and PWR 2 Connectors

Here are the materials and tools needed to build the DC power cables:

- 18 AWG stranded wires. Do not use wire heavier than 16 AWG.
- 2-wire connectors to connect the power cables to the AC/DC rectifiers or UPS units.
- #1 flat-head screwdriver
- Wire insulation stripper

To build DC power cables for the unit, perform the following procedure:

1. Strip 6.5mm (0.25 in.) of insulation from the ends of the stranded power wires with a wire insulator stripper. Refer to Figure 56 on page 108.

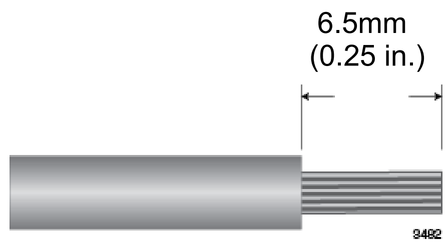


Figure 56. Stripping a Power Cable Wire

Warning
Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. E10

2. Tightly wrap the wire strands with your finger tips. Refer to Figure 50 on page 104.

   This step is to prevent loose strands from touching other wires and causing an electrical short.

   Note
   Allied Telesis recommends tinning the wires with solder as added protection against loose strands. This guide does not provide instructions on how to tin wires.

3. Remove the PWR 1 - PWR 2 connector from the top panel. Refer to Figure 57.

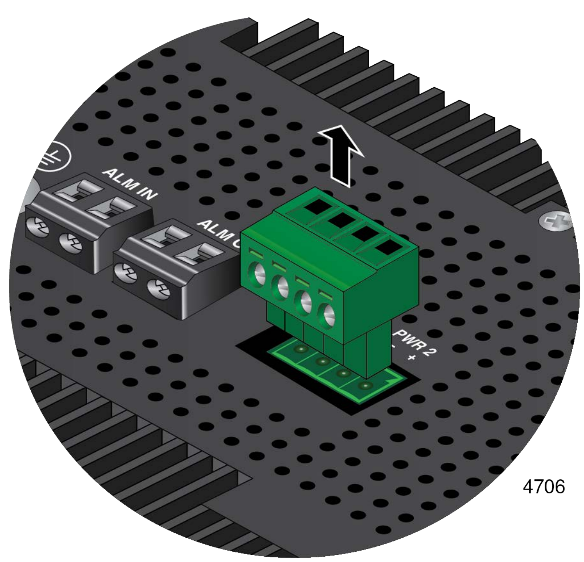


Figure 57. Removing the PWR 1 - PWR 2 Cable Connector

4. Loosen the wire retaining screws in the connector with a #1 screwdriver. Refer to Figure 58.

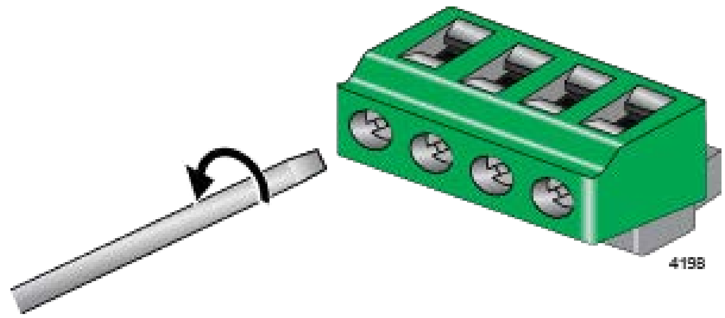


Figure 58. Loosening the Wire Retaining Screws on the PWR 1 - PWR 2 Cable Connector

5. Insert the wires into the connector and tighten the retaining screws to secure the wires. Refer to Figure 59. If you are using only one power supply, you may use either PWR 1 or PWR 2.

   Allied Telesis recommends tightening the screws to 2 to 3 in.-lbs.

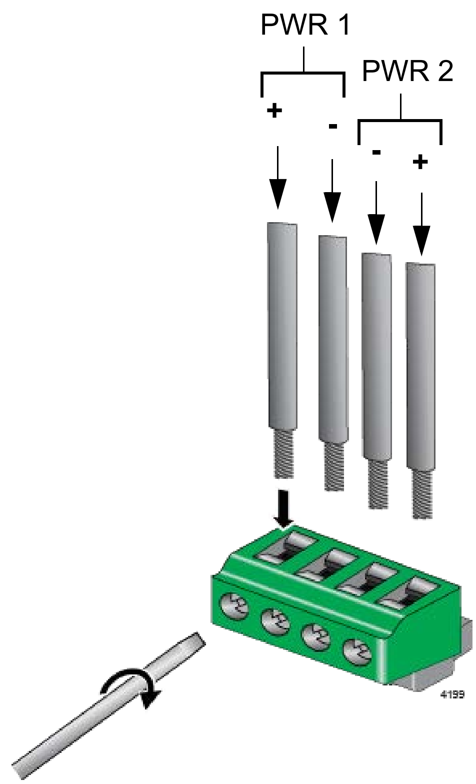
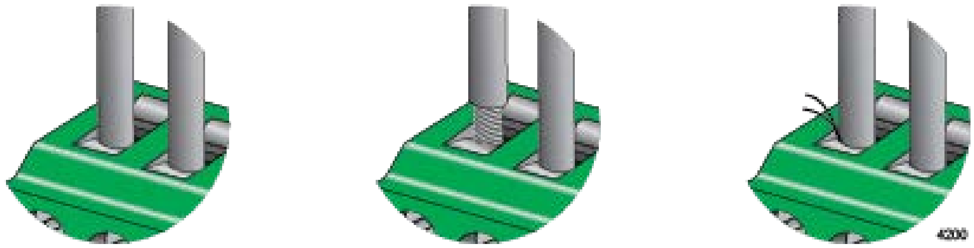


Figure 59. Inserting the Wires into the PWR 1 - PWR 2 Cable Connector

6. After attaching the wires to the connector, verify that there are no exposed wires or loose wire strands. Refer to Figure 60 on page 110.



Correct | Incorrect - Exposed wire. | Incorrect - Loose wire strands

Figure 60. Verifying the Wire Installation

Warning
Check to see if there are any exposed copper strands coming from the installed wires. When this installation is done correctly there should be no exposed copper wire strands extending from the terminal block. Any exposed wiring can conduct harmful levels of electricity to persons touching the wires. E12

7. After building the power cables, go to “Powering On the Switch” on page 111.

Powering On the Switch

This section contains the procedure for powering on the switch. For power supply requirements, refer to “Switch DC Power Requirements” on page 50 and “DC Power Specifications” on page 132.

Note
The switch can update its release or configuration file from a USB flash drive during the initial power up of the unit. This is called the Autoboot feature. Using the Autoboot feature is optional. It is only available during the initial power up of the unit. To use the feature, insert a USB flash drive with the appropriate files into the USB port on the switch before powering on the unit. For more information, refer to the *Software Reference for the IE340 Switches*.

Warning
An operational unit can be hot. Exercise caution when touching it with unprotected hands.

To power on the chassis, perform the following procedure:

1. Verify that the DC power supply is powered off. If there are two DC power supplies, verify that both units are powered off.

2. Connect the power cable to the PWR 1 - PWR 2 connector on the top panel. Refer to Figure 61.

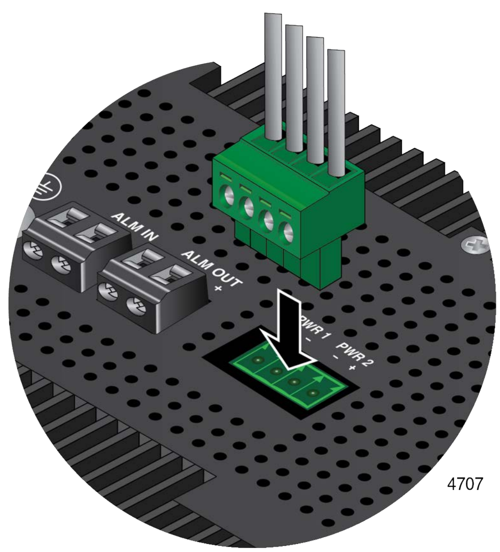


Figure 61. Connecting the Power Cable to the PWR 1 - PWR 2 Connector

3. Connect the other end of the power cable to the DC power supply. Refer to the documentation included with the unit for instructions.

4. Power on the DC power supplies.

Note
The switch does not have an On/Off switch.

It takes two to three minutes for the switch to initialize the AlliedWare Plus operating system. You can monitor the bootup sequence by connecting a terminal or computer with a terminal emulator program to the Console port on the front panel, as explained in “Through the Console Port” on page 113.

5. After the switch has initialized its operating system, go to “Verifying Switch Operations,” next.

Verifying Switch Operations

Here are items to check to verify that the switch is operating normally. If there is a problem, refer to Chapter 6, “Troubleshooting” on page 121 for suggestions on how to resolve it.

- ❒ The Fault LED should be off.
- ❒ One or both PWR 1 and PWR 2 LEDs should be solid green, depending on the number of DC power supplies connected to the unit.
- ❒ The LEDs on SFP slots with transceivers connected to active network devices should be solid or flashing green.
- ❒ The Link LEDs on copper ports connected to active network devices should be solid or flashing green or amber. The Link LEDs are identified in Figure 8 on page 36.
- ❒ The PoE LEDs on the switch should be solid green on ports that are connected to PoE or PoE+ devices. The PoE LEDs are identified in Figure 8 on page 36.

After verifying the operations of the switch, go to “Starting a Management Session” on page 113.

Starting a Management Session

The following procedures explain the different methods for starting the first management session on the switch:

- “Through the Console Port” on page 113
- “With a DHCP or DHCPv6 Server” on page 115
- “Without a DHCP or DHCPv6 Server” on page 116

Through the Console Port

This section explains how to start a local management session with the command line interface through the Console port. The guidelines are as follows:

- Local management sessions require a terminal, computer, or laptop with an RS-232 serial port or USB port, and a terminal emulator, such as PuTTy.
- Local management sessions also require a management cable. If your computer has an RS-232 port, you can use the management cable supplied with the product. The cable, shown in Table 11 on page 65, has RJ-45 and DB-9 connectors. The cable wiring specifications are provided in “RJ-45 Style Serial Console Port Pinouts” on page 138.
- If your computer has a USB port, you will need a USB-to-Serial converter that is compatible with its operating system. An example is the VT-Kit3 converter from Allied Telesis. Refer to Figure 11 on page 40.
- Local management sessions do not interfere with the network operations of the switch.
- The switch does not need an IP address for local management sessions.
- The web browser interface is not available through the Console port.
- The switch comes from the factory without a configuration file for storing its parameter settings. It automatically creates a file the first time you save the parameter settings.

To start a local management session, perform the following procedure:

1. Power on the switch and wait several minutes as it initializes the AlliedWare Plus management software.

2. Connect your computer to the Console port on the switch:

   - If your computer has an RS-232 port, you can use the management cable supplied with the product.
   - If your computer has a USB port, use a USB-to-Serial converter, such as the VT-Kit3.

3. Configure the VT-100 terminal or terminal emulation program:

   - Baud rate: 9600 bps (The baud rate of the Console port is adjustable from 1200 to 115200 bps. The default is 9600 bps.)
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow controller: None

   Note
   The port settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulator program.

   Note
   The baud rate must be set to the default 9600 bps to configure the boot loader.

4. Press Enter. You are prompted for the name and password of the manager account.

5. Enter the user name “manager” and password “friend”, without the quote marks.

   Note
   User names and passwords are case sensitive.

   The switch starts the local management session and displays the following prompt:

   ```
   awplus>
   ```

   The prompt is the User Exec mode of the command line interface.

6. Go to “Verifying PoE” on page 118.

With a DHCP or DHCPv6 Server

This section contains the procedure for starting the first management session with the switch on a network that has a DHCP or DHCPv6 server. Review the following factory default settings for the switch when powered on for the first time:

- DHCP and DHCPv6 clients: enabled
- SSH server: enabled
- Telnet server: disabled
- Web server: enabled
- Switch ports: enabled
- VLAN membership: port-based VLAN1
- Configuration file: none (The switch automatically creates a configuration file the first time you save its parameter settings.)

To start a management session on the switch over a network that has a DHCP or DHCPv6 server, perform the following procedure:

1. Enter the MAC address of the switch into your DHCP or DHCPv6 server so that the server assigns an address to the switch when you power it on. The MAC address label is shown in “Recording the Serial Number and MAC Address” on page 70. Refer to your DHCP server’s documentation for instructions.

2. Connect a single Ethernet port on the switch to your existing network.

3. Power on the switch and wait several minutes as it initializes the AlliedWare Plus management software and obtains its IPv4 or IPv6 address from the DHCP server.

4. On your management workstation, enter the switch’s assigned IP address into a Secure Shell (SSH) application or the URL field of your web browser on your workstation.

5. Press Enter. You are prompted for the name and password of the manager account.

6. Enter the user name “manager” and password “friend”, without the quote marks.

Note
User names and passwords are case sensitive.

The switch starts the local management session and displays the following prompt:

```
awplus>
```

The prompt is the User Exec mode of the command line interface.

7. Go to “Verifying PoE” on page 118.

Without a DHCP or DHCPv6 Server

This section contains the procedure for starting the first management session with the switch on a network without a DHCP or DHCPv6 server. Review the following factory default settings for the switch when powered on for the first time:

- Default IP address (no DHCP server): 169.254.42.42 (255.255.0.0)
- SSH server: enabled
- Telnet server: disabled
- Web server: enabled
- Switch ports: enabled
- VLAN membership: port-based VLAN1
- Configuration file: none (The switch creates a configuration file the first time you save its parameter settings.)

To start a management session on the switch over a network without a DHCP or DHCPv6 server, perform the following procedure:

1. Change the IP address of your workstation to 169.254.42.*n*/16 (255.255.0.0), where *n* is any number from 1 to 254, but not 42.

2. Connect the Ethernet port on your workstation to an Ethernet port on the switch.

3. Power on the switch and wait several minutes as it initializes the AlliedWare Plus management software.

4. Enter the IP address 169.254.42.42, the switch’s default IP address, in an SSH application or the URL field of the web browser on your workstation.

5. Press Enter. You are prompted for the name and password of the manager account.

6. Enter the user name “manager” and password “friend”, without the quote marks.

Note
User names and passwords are case sensitive.

The switch starts the local management session and displays the following prompt:

```
awplus>
```

The prompt is the User Exec mode of the command line interface.

7. Go to “Verifying PoE” on page 118.

Verifying PoE

This section contains the procedures for verifying and, if necessary, configuring the PoE budgets on the IE340-12GP, IE340-20GP, and IE340L-18GP Switches. The procedures are listed here:

- “Verifying the PoE Budget,” next
- “Configuring the PoE Budget” on page 119

Note
The IE340-12GPIE340-12GT Switch does not support PoE.

Verifying the PoE Budget

The PoE budget is the maximum wattage the switch has available for the powered devices on its copper ports. The budget should be 240W for power supplies that meet the specifications in “Switch DC Power Requirements” on page 50.

Note
IE340 Switches powered by power supplies that do not meet the requirements in “Switch DC Power Requirements” on page 50 and “DC Power Specifications” on page 132 might have lower PoE budgets.

The procedure assumes you have already started a local management session on the switch. For instructions, refer to “Starting a Management Session” on page 113. To confirm the PoE budget, perform the following procedure:

1. Enter the ENABLE command at the User Exec mode to move to the Privileged Exec mode, as shown here:

```
awplus> enable
awplus#
```

2. Enter the SHOW POWER-INLINE command at the Privileged Exec mode prompt, as shown here:

```
awplus# show power-inline
```

3. Examine the Power Allocated field in the command output.

   It should be 240W. This is the maximum PoE budget for the powered devices on the ports of the switch sourcing PoE.

   - If the power budget is 240W, go to the next step.

- If the power budget is less than 240W, either the power supply does not meet the specifications in “Switch DC Power Requirements” on page 50 or it has a problem. If the latter, refer to Chapter 6, “Troubleshooting” on page 121 for troubleshooting suggestions.

4. Review the following information.

   Ports connected to non-PoE devices do not require any further configuration steps. The ports function as regular networking ports, but without power for PoE devices.

   The default PoE values for ports sourcing PoE are listed here:

   - PoE is enabled.
   - The wiring configuration is Alternative A. (This parameter is not adjustable.)

   No further configuration steps are required for ports connected to the following types of powered devices:

   - PoE or PoE+ devices that comply with PoE standards and support both Alternatives A and B.
   - Legacy devices that only support Alternative A.

   The above devices should now be receiving power from the ports on the switch.

Configuring the PoE Budget

The following procedure explains how to verify and, if necessary, adjust the PoE power budgets of the IE340-12GP, IE340-20GP, and IE340L-18GP switches. This value is the maximum wattage the switch is expecting from the power supply for the powered devices on its ports.

Because the switch consumes part of the input power itself, the PoE power budget must be less than the maximum power sourced from the DC power supply. The basic rule is as follows:

Pa = Pi - Pc

Where:

Pa = Available power for PoE sourcing on the copper ports on the switch.

Pi = Maximum input power from the external DC power supply to the switch.

Pc = Maximum power consumed by the switch.

If the PoE power budget is above the available input power, the switch may experience problems. For instance, it may attempt to distribute more power than it actually has available from the power supply or display the PoE Status LEDs incorrectly.

To verify and adjust the maximum provisioned PoE budget for the switch, perform the following

1. In the Privileged Exec mode, enter the SHOW POWER-INLINE command:

```
awplus# show power-inline
```

2. Compare the Nominal Power and Power Allocated fields in the command output. The Nominal Power field is the provisioned PoE budget of the switch. It is the wattage the switch is expecting from the power supply for PoE devices. The Power Allocated is the actual wattage the switch is receiving from the power supply. The default value for the provisioned budget is 240W.

3. Do one of the following:

   ❒ If the values in the Nominal Power and Power Allocated fields are the same, no further installation steps are required. Refer to the *IE340 Switches Command Reference for AlliedWare Plus* for further management instructions.

   ❒ If the values are different, continue with the next step:

4. Enter the CONFIGURE TERMINAL command to move to the Global Configuration mode:

```
awplus# configure terminal
awplus(config)#
```

5. In the Global Configuration mode. enter the POWER INLINE WATTAGE MAX command to change the nominal value to be either equal to or less than the actual wattage value. The format of the command is given here:

   `power inline wattage max` *max*

   The max variable is the value from the Power Allocated field from the SHOW POWER-INLINE command. For example, if the Power Allocated field has the value 180W, the command would be:

```
awplus(config)# power inline wattage max 180
```

   The provisioned PoE budget of the switch is now set. Refer to the *IE340 Switches Command Reference for AlliedWare Plus* for management instructions.

Chapter 6

Troubleshooting

This chapter has suggestions on how to troubleshoot problems with the switch. The sections in the chapter are listed here:

Note
For further assistance, contact Allied Telesis Technical Support at **www.alliedtelesis.com/support**.

PWR 1 and PWR 2 LEDs

Problem: A DC power supply is connected to the switch, but the corresponding PWR 1 or PWR 2 LED on the front panel is off.

Solutions: The unit is not receiving power from the power supply or the power is outside the operating range of the switch. Try the following:

- Verify that the DC power source is powered on and operating normally.
- Review the DC power source's documentation to verify that it is compatible with the switch. The power supply requirements for the switch are given in "Switch DC Power Requirements" on page 50 and "DC Power Specifications" on page 132.
- Verify that the PWR 1 -PWR 2 connector is fully inserted into the slot in the top panel of the switch.
- Verify that the DC wires are securely connected to the PWR 1 - PWR 2 connector on the switch and to the DC power supply.
- Verify that the DC positive and negative wires from the power supplies are connected to the correct connectors on the DC PWR 1 - PWR 2 connectors on the switch.
- Verify that the DC power wires are connected to the PWR 1 - PWR 2 connector and not to the ALM IN or ALM OUT connector.
- Try using a different DC power source.
- Try replacing the DC power wires.
- Try connecting the DC power source to a different device.
- Test the output voltage from the power source to verify that it is within the operating range of the switch.

Problem: The DC power supply is supplying only partial power to the switch.

- Verify that the power supply meets the requirements in "Switch DC Power Requirements" on page 50 and "DC Power Specifications" on page 132.
- Verify that the power supply is not overheating. If necessary, increase ventilation around the power supply.
- The power supply might be failing. Replace the power supply.

Copper Ports

Problem: The switch is powered on and forwarding traffic, but all the port LEDs are off.

Solutions: The port LEDs may have been turned off with the ECOFRIENDLY LED command in the AlliedWare Plus management software. To turn on the LEDs, establish a management session with the unit and issue the NO ECOFRIENDLY LED command in the Global Configuration mode. The default setting for the LEDs is on.

Problem: A copper port on the switch is connected to a network device but the port’s LINK/ACT LED is off.

Solutions: The port is unable to establish a link to a network device. Try the following:

- Verify that the port is connected to the correct copper cable.
- Verify that the network device connected to the copper port is powered on and is operating properly.
- Verify that the network cable is securely connected to the ports on the switch and remote network device.
- Try connecting another network device to the copper port with a different cable. If the copper port is able to establish a link, then the problem is with the cable or the other network device.
- Verify that the copper cable does not exceed 100 meters (328 feet).
- Verify that you are using the appropriate category of copper cable. Refer to “Cable Requirements” on page 28.
- Use the switch’s management software to verify that the port is enabled.
- If the remote network device is a managed device, use its management firmware to verify that its port is enabled.

Note
A 1000Base connection might require five to ten seconds to establish a link.

Problem: Network performance between a copper port on the switch and a network device is slow.

Solution: There might be a duplex mode mismatch between the port and the network device. This can occur when a copper port using Auto-Negotiation is connected to a remote device that has a fixed speed of 10M or 100M and a fixed duplex mode of full duplex. If this is the cause of the problem, manually adjust the duplex mode of the port on the network device or switch so that both ports are using the same duplex mode. For the switch, use the management software to determine the duplex mode settings of the ports.

Power Over Ethernet

Problem: The switch is not providing power or only partial power to powered devices on the copper ports:

Solutions: Try the following:

- Review the powered device's documentation to confirm that it is compliant with one of the PoE standards in "PoE Versions" on page 29 and that its power requirements do not exceed those listed in Table 1 on page 29. Legacy devices that are non-standard or were manufactured before the completion of the standards might not be compatible with IE220 Switches.
- Check the port's PoE LED. If the LED is solid amber, the switch shutdown PoE on the port because of a fault condition. If the LED is flashing amber, the switch does not have sufficient unused power to allocate to the powered device.
- Start a local or remote management session on the switch and enter the SHOW POWER-INLINE command. Subtract the Actual Power Consumption value from the Power Allocated value to determine the amount of unused power. The switch cannot support the powered device if this value is less than the device's power requirements.
- Verify that you are using the appropriate category of twisted-pair cable by referring to "Cable Requirements" on page 28.
- Try replacing the copper cable.
- Use the management software on the switch to determine whether PoE+ is enabled on the port. The default setting is enabled.
- Use the SHOW POWER-INLINE command to determine whether the PoE power setting for the port was reduced to a value below the power requirements of the device.
- Try connecting the device to a different port on the switch.
- Verify that the switch is not overheating. If the switch is installed in an enclosure, verify that the enclosure provides adequate ventilation.

SFP Slots

Problem: An SFP transceiver in a switch port is connected a network device, but the LINK/ACT LED is off.

Solutions: The transceiver cannot establish a link to the network device. Try the following:

- Verify that the remote network device connected to the fiber optic port is operating properly.
- Verify that the fiber optic cable is securely connected to the port on the SFP module and to the port on the remote network device.
- Verify that the port is connected to the correct fiber optic cable.
- Check that the SFP transceiver is fully inserted in the slot in the switch.
- Verify that the operating specifications of the fiber optic ports on the transceiver and remote network device are compatible.
- Verify that the correct type of fiber optic cabling is being used.
- Try connecting another network device to the fiber optic port using a different cable. If the port is able to establish a link, then the problem is with the cable or with the other network device.
- Use the switch's management software to verify that the port is enabled.
- If the remote network device is a managed device, use its management firmware to verify that its port is enabled.
- If the problem is with two BiDi (bi-directional) transceivers, refer to their data sheets to verify that their transmission and reception frequencies are opposite each other. For instance, a BiDi transceiver that transmits and receives at 1310nm and 1550nm, respectively, has to be connected to a transceiver that transmits and receives at 1550nm and 1310nm, respectively. Two BiDi transceivers that transmit and receive at the same frequencies will not establish a link.
- Test the attenuation of both directions on the fiber optic cable with a fiber optic tester to determine whether the optical signal is too weak (sensitivity) or too strong (maximum input power).

Appendix A

Technical Specifications

This appendix contains the following sections:

Physical Specifications

Dimensions

Table 15. Product Dimensions (W x H x D)

IE340 Switches	9.1 x 15.3 x 13.9 cm (3.58 x 6.02 x 5.47 in)

Weights

Table 16. Product Weights

IE340 Switch with DIN rail bracket	2.34 kg (5.16 lbs)
IE340 Switch with wall brackets	2.23 kg (4.91 lbs)

Ventilation

Table 17. Ventilation Requirements for Cabinet Installation

Minimum Open Space Below Switch	5.08 cm (2.0 in)
Minimum Open Space Above Switch	5.08 cm (2.0 in)
Minimum Open Space in Front of Switch	5.08 cm (2.0 in)
Minimum Open Space On Sides of Switch	5.08 cm (2.0 in)

Cabinet (Enclosure) Dimensions

Table 18. Minimum Cabinet (Enclosure) Dimensions

Minimum Cabinet Dimensions (W x H x D)	50.8 x 50.8 x 30.5 cm (20.0 x 20.0 x 12.0 in)

Note

The enclosure size should be determined by considering multiple factors. This includes the outside ambient temperature, total heat generated from the installed equipment, sealed or unsealed enclosure type, enclosure material, paint color, mounting method (wall, pole, ground, etc.), and sun load. The smaller enclosure size you choose, the higher risk of overheating the product faces.

If the product overheats in an enclosure that was built without taking into account these factors, the warranty of the product might be voided. Consult Allied Telesis when assistance is needed.

Environmental Specifications

Note
The switch does not require an enclosure when installed in most indoor environments. However, the switch must be installed in a UL Listed or Nationally Recognized Test Lab enclosure when used in an indoor Measurement, Control, or Laboratory environment, as specified in UL/EN/IEC 61010-1 and 61010-2-201.

Warning
You must use a UL Listed 3X or 4X enclosure when installing the device in an outdoor environment.

Note
The IE340L-18GP switch is not compliant with UL/EN/IEC 61010-1 and 61010-2-201 and should not be used in an indoor Measurement, Control, or Laboratory environment.

Table 19. Operating Temperature Ratings

Model Name	Operating Temperature Ranges[1]			
	Rating	Enclosure Type		
		Sealed Enclosure: 0 LFM[2]	Ventilated Airflow: 40 LFM	Cooling Fan Airflow: 150 LFM
IE340-12GP		-40°C to 65°C (-40° F to 149° F)	-40°C to 70°C (-40°F to 158°F)	-40°C to 75°C (-40°F to 167°F)
IE340-12GT	-40°C to 75°C (-40° F to 167° F)	-40°C to 75°C (-40°F to 167°F)		
IE340-20GP		-40°C to 65°C (-40° F to 149° F)	-40°C to 70°C (-40°F to 158°F)	-40°C to 75°C (-40°F to 167°F)
IE340L-18GP	-40°C to 65°C (-40° F to 149° F)	-40°C to 55°C (-40°F to 131°F)	-40°C to 65°C (-40°F to 149°F)	

1. These values are for vertical mounting orientation. For horizontal mounting orientation, reduce the maximum values by 5°C.
2. Linear Feet per Minute

Table 20. Environmental Specifications

Storage Temperature	-40° C to 85° C (-40° F to 185° F)
Operating Humidity	5% to 95% noncondensing
Storage Humidity	5% to 95% noncondensing
Maximum Operating Altitude	3,000 m (9,843 ft)

Table 21. Ingress Protection

IE340 Switch	IP30

DC Power Specifications

Table 22. Input Voltage Specifications

<table>
<tr><th>Switch</th><th>PoE</th><th>PoE+</th><th>Non-PoE</th></tr>
<tr><td>IE340-12GP</td><td rowspan="3">46-57VDC</td><td rowspan="3">52.5-57VDC</td><td>18-57VDC</td></tr>
<tr><td>IE340-20GP</td><td>18-57VDC</td></tr>
<tr><td>IE340L-18GP</td><td>46-57VDC</td></tr>
<tr><td>IE340-12GT</td><td>N/A</td><td>N/A</td><td>18-57VDC</td></tr>
</table>

Table 23. Maximum Power Consumptions

<table>
<tr><td>IE340-12GP</td><td rowspan="3">271 watts (including PDs’ consumption)
31 watts (excluding PDs’ consumption)
24 watts (without PoE load)</td></tr>
<tr><td>IE340-20GP</td></tr>
<tr><td>IE340L-18GP</td></tr>
<tr><td>IE340-12GT</td><td>24 watts</td></tr>
</table>

Note
For more power supply specifications, see “Switch DC Power Requirements” on page 50.

Table 24. Heat Dissipation

<table>
<tr><th>Switch</th><th>PoE</th><th>PoE+</th><th>Non-PoE</th></tr>
<tr><td>IE340-12GP</td><td rowspan="3">105.8 BTU/hr</td><td rowspan="3">105.8 BTU/hr</td><td rowspan="4">81.9 BTU/hr</td></tr>
<tr><td>IE340-20GP</td></tr>
<tr><td>IE340L-18GP</td></tr>
<tr><td>IE340-12GT</td><td>N/A</td><td>N/A</td></tr>
</table>

Note
The cooling requirements of the switch are smaller than the power draw because most of the load is dissipated at the PoE powered device and along the cabling. Use these BTU ratings for facility capacity planning.

Table 25. ALM IN and ALM OUT Power Ratings

ALARM OUT	30VDC maximum	0.5A maximum
ALARM IN	3.3VDC minimum	320uA

Note
For ALARM IN and ALARM OUT wiring specifications, see “Wiring the ALM IN and ALM OUT Connectors” on page 102.

Electromagnetic and Environmental Test Types

The IE340 Switches passed the tests in Table 26 and Table 27 on page 135.

Table 26. Electromagnetic Compatibility Test Types

Test Type	Test Standard	Test Severity Level
Electromagnetic Immunity	EN 50121-4 EN 55035 EN 61000-6-2 IEC 62236-4	
Harmonic emission	EN/IEC 61000-3-2[1]	
Flicker emission	EN/IEC 61000-3-3[1]	
Electrostatic Discharge (ESD)	EN/IEC 61000-4-2	Contact discharge: 6V (level 3) Air discharge: 8kV (level 3)
Radiated Susceptibility (RS)	EN/IEC 61000-4-3	Radiated Immunity: 20V/m (level X) @80~1000MHz[2] 10V/m (level 3) @80~800MHz @1.4~2.0GHz 5V/m (level 2) @2.0~2.7GHz 3V/m (level 2) @80~1000MHz @1.4~2.0GHz, @5.1~6.0GHz 1V/m (level 1) @2.0~2.7GHz
Electrical Fast Transient (EFT)	EN/IEC 61000-4-4	Signal ports: 2kV (level 4) DC input power ports: 2kV (level 3) Earth ports: 1kV (level 2)
Lighting/Surge immunity (Surge)	EN/IEC 61000-4-5	Signal ports: line-to-earth 2kV (level 3) line-to-line - DC input power ports: line-to-earth 2kV (level 3) line-to-line 1kV (level 3)
Conducted immunity (CS)	EN/IEC 61000-4-6	Signal ports: 10Vrms (level 3) @0.15~80MHz 3Vrms (level 2) @0.15~80MHz 3Vrms to 1Vrms (level 2 to 1) @0.1~30MHz 1Vrms (level 1) @30~80MHz DC input power ports: 10Vrms (level 3) @0.15~80MHz 3Vrms (level 2) @0.15~80MHz 3Vrms to 1Vrms (level 2 to 1) @0.1~30MHz 1Vrms (level 1) @30~80MHz Earth ports: 10Vrms (level 3) @0.15~80MHz
Power Frequency Magnetic Field	EN/IEC 61000-4-8	30A/m (level 4)

Table 26. Electromagnetic Compatibility Test Types (Continued)

AC voltage dips and interruption	EN/IEC 61000-4-11[1]	ΔU 30% for 500ms ΔU 60% for 200ms ΔU 95% for 5s ΔU 95% for 10ms
DC voltage dips and interruption	EN/IEC 61000-4-29	ΔU 0% for 10ms ΔU 0% for 30ms, 100ms, 300ms, 1s ΔU 40% & 70% for 10ms, 30ms ΔU 40% & 70% for 100ms, 300ms, 1s ΔU 100% & 120% for 100ms to 10s
Electromagnetic emissions	AS/NZS CISPR 32 CISPR 11 CISPR 32 EN55032 FCC 47 CFR Part 15, subpart B ICES 003 VCCI	Class A Class A Class A Class A Class A Class A

1. Applicable when the IE340 Switch is powered by an AC/DC power supply unit (e.g., IE048 Industrial Power Supply).
2. Applicable when the IE340 Switch is installed in a metal enclosure with CAT6A STP cables on the LAN ports.

Table 27. Environmental and Endurance Test Types

Test Type	Test Standard	Test Severity Level
Thermal test		
Cold	EN/IEC 60068-2-1	-40°C, 4 days (96 hrs)[1]
Dry heat	EN/IEC 60068-2-2	+75°C, 21 days (504 hrs)[1] +85°C, 0% RH, 7 days (168 hrs)
Composite temp/ humidity cyclic	EN/IEC 60068-2-38	-40°C to +75°C, 0% to 95% RH, 10 cycles of 24 hrs (240 hrs)[1]
Damp heat, steady state	EN/IEC 60068-2-78	+40°C, 93% RH, 21 days (504 hrs)[1]
Damp heat, cyclic	EN/IEC 60068-2-30	+25°C to +40°C, 75% to 95% RH, 21 cycles of 24 hrs (504 hrs)[1]
Vibration	IEC 60068-2-6	Operational: 2g @10~500Hz
	IEC 61131-2	Operational: 1g @5~150Hz
Shock	IEC 60068-2-27	Operational: 20g @11ms, half sine (DIN rail mount) Operational: 45g @11ms, half sine (wall mount) Non-operational: 65g @11ms, half sine
	IEC 61131-2	Operational shock: 15g @11ms, half sine
Rough handling shock	IEC 60068-2-31	1m drop; all faces (class T2.3)
Free-fall shock	IEC 61131-2	1m drop; all faces, edges and corners

1. Test performed twice.

RJ-45 Copper Port Pinouts

Figure 62 identifies pin 1 on an RJ-45 copper port.

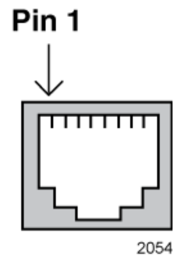


Figure 62. RJ-45 Port Pin Layout (Front View)

Table 28 lists the pin signals for a port when it is operating at 10M or 100M.

Table 28. Pin Signals for 10M and 100M

Pin	MDI Signal	MDI-X Signal
1	TX+	RX+
2	TX-	RX-
3	RX+	TX+
4	Not used	Not used
5	Not used	Not used
6	RX-	TX-
7	Not used	Not used
8	Not used	Not used

Table 29 lists the pin signals for a port when it operating at 1G.

Table 29. Pin Signals for 1G

Pinout	Pair
1	Pair 1 +
2	Pair 1 -
3	Pair 2 +
4	Pair 3 +
5	Pair 3 -
6	Pair 2 -
7	Pair 4 +
8	Pair 4 -

RJ-45 Style Serial Console Port Pinouts

Figure 63 identifies pin 1 on the RJ-45 connector on the Console port.

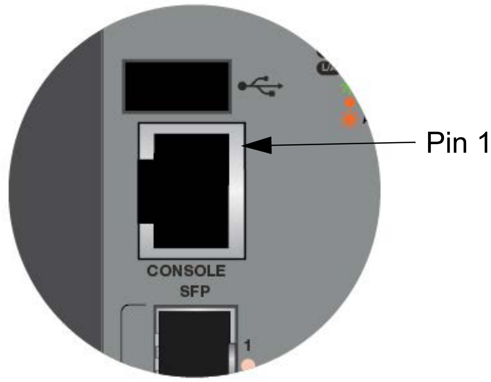


Figure 63. Console Port Pin Layout (Front View)

Table 30 lists the pin signals for the RJ-45 style serial Console port.

Table 30. RJ-45 Style Console Port Pin Signals

Pin	Signal
1	Open
2	Looped to pin 7
3	Transmit Data
4	Ground
5	Ground
6	Receive Data
7	Looped to pin 2
8	Open

PWR 1 and PWR 2 DC Power Connectors

Table 31. PWR 1 and PWR 2 DC Connector Pin Signals on the IE340-12GP, IE340-12GT, and IE340-20GP Switches

Pin	Signal
+	24/48/54 VDC
-	VDC Return

Table 32. PWR 1 and PWR 2 DC Connector Pin Signals on the IE340L-18GP Switch

Pin	Signal
+	48/54 VDC
-	VDC Return

Device Dimensions

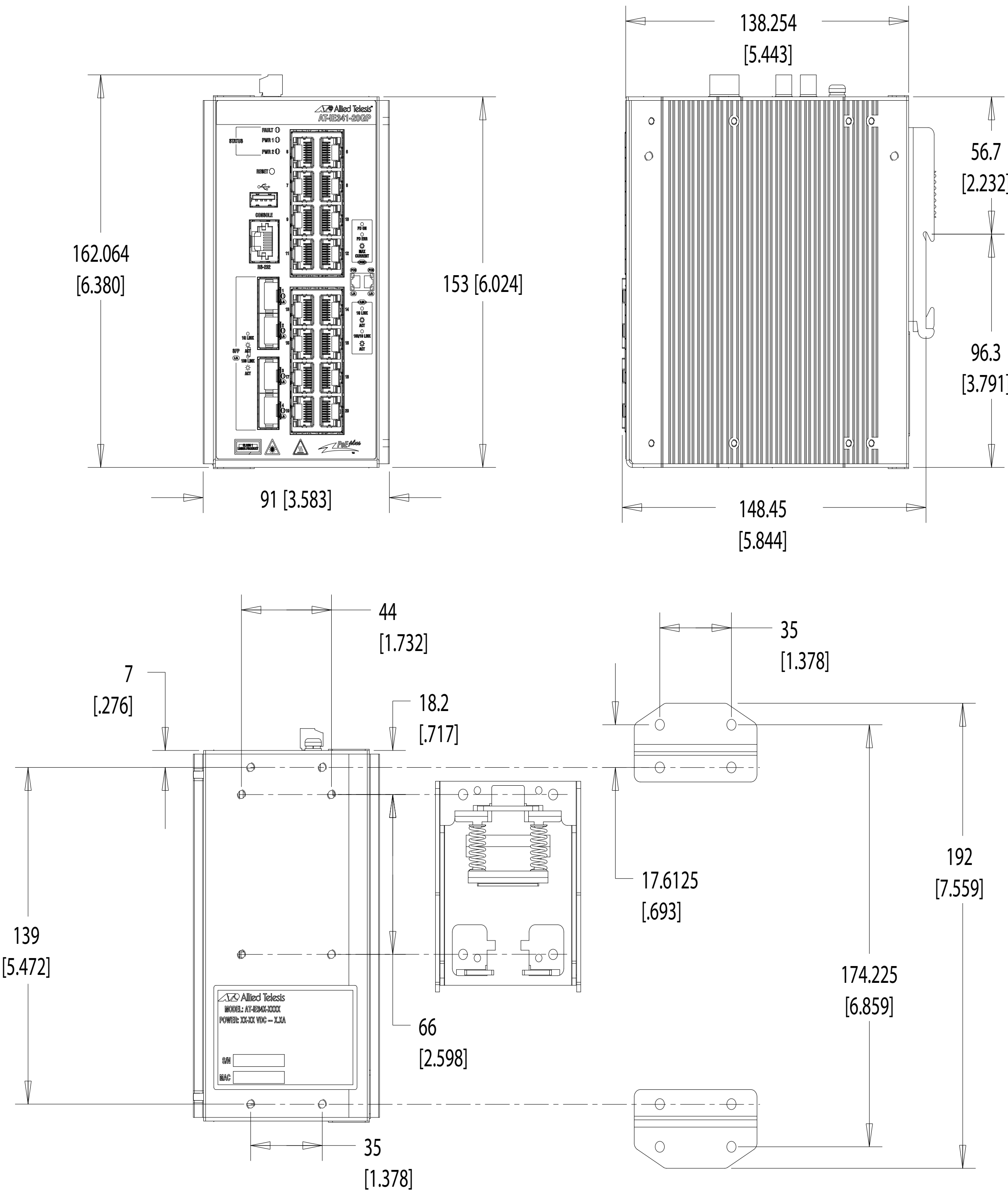


Figure 64. IE340 Switches Dimensions