IDS-710HP Hardware Installation Guide

PoE Managed Industrial Ethernet Switches

www.perle.com

Table of Contents

Preface

Audience

This guide is for the network or computer technician responsible for installing Perle IDS Switch. Familiarity with the concepts and terminology of Ethernet and local area networks is required.

Purpose

This document describes the hardware and physical characteristics of the Perle IDS Switch. It covers hardware features as well as installation and operation of the switch. This document does not cover how to configure your Perle IDS Switch. Information to configure your Perle IDS Switch can be found in the IDS PoE Switches User Guide.

Package Contents

- IDS Switch with attached DIN rail mounting bracket
- IDS-710HP Switches Quick Start Guide

Document Conventions

This document contains the following conventions:

Most text is presented in the typeface used in this paragraph. Other typefaces are used to help you identify certain types of information. The other typefaces are:

Note: *Means reader take note*: notes contain helpful suggestions.

Caution: Means reader be careful. In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning: **IMPORTANT SAFETY INSTRUCTIONS**
Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Only qualified personnel should connect power to this unit.

⚠ Warning – more information is contained within this guide

⚠ Warning – equipment rated above 40°C. Equipment may be very hot.

Overview

This chapter discusses the following topics:

Switch Models Views
LED Indicators
Ports
Port Status Indicators
Terminal Block Connectors
Installation

The table below gives a brief overview of the models covered in this guide. For more details and for the most up-to-date list of models, please refer to the product pages at: *www.perle.com*

Standard Models	10/100/1000 Base-T Ethernet Ports PoE Enabled	Fixed SFP Port	Software Set	Temp
IDS-710HP	8	2	Pro	Standard
IDS-710HP-XT	8	2	Pro	Industrial

Switch Models Views

IDS-710HP (including XT models)

1 – Reset / FS (Fast Setup)	6 – SFP slots
2 – Status LEDs	7 – 10/100/1000Base-T Ethernet Ports with PoE/PoE+/PoE++ capability
3 – Terminal Block for Digital Input and Relay	8 – Terminal Block for Power 1, 2
4 – SFP status LEDs	9 – Wall Mount Bracket Screw Holes
5 – Console Port – MicroUSB	10 – DIN Rail Clip

LED Indicators

PWR (Power Inputs)

State	Description
Green	P1 and P2 power within specifications

State	Description
Yellow - solid	P1 or P2 providing power within specifications
Red	Neither P1 and P2 providing power within specifications

Sys (System Status)

State	Description
Green - blinking (after power on)	System booting
Green - solid	System ready/operating normally
Green - blinking slowly	Fast Setup Mode activated/port available
Green - blinking fast	Fast Setup Mode activated/no port available
Red	Hardware fault or firmware load error

Alr (Alarm)

State	Description
Off	No alarms configured
Green - solid	Alarms configured, but no alarms detected
Red solid	Alarm condition detected
Red blinking	Alarm condition detected and Alarm Relay activated

Ports

10/100/1000Base-T Ports with PoE/PoE+/PoE++ capability

These ports provide the standard 10/100/1000 Mb/s Ethernet through twisted pair (UTP) cables of up to 100 meters (328ft) in length. Ports 1 through 8 can provide power to PoE/PoE+/PoE++ PD devices.

SFP Slots

The SFP slots can accommodate industry standard SFPs from Perle or other suppliers. These SFPs can be fiber or copper. The fiber SFP run at a speed of 1000 or 2500 Mbps. The copper SFP are SGMII based and can support speeds of 10/100/1000 Mbps.

USB Console Port

The MicroUSB port is the switch's console port. When connected the port presents a serial interface that can be used from a PC Terminal emulation program (such as PuTTY). This provides access to the switch management function using the industry standard CLI command set.

Power Connector

The power input connector has provisions for dual inputs. Two independent power sources can be used to power the switch. If one power input fails, the other power input will power the switch.
See - **Terminal Block Connectors**

Alarm Relay Connector

The Alarm Relay can be energized by the software or hardware under certain conditions. It can then be used to trigger an external alarm circuit such as a light or sounding device. This connector provides a Normally opened (NO) dry contact on the connector block.

Digital Input Connector

A Digital Input is provided. It can be used for the generation of alarms (SNMP trap, energizing of on board Alarm Relay etc.).

Port Status Indicators

Ethernet Port Status Indicators

Port Link / Speed

State	Description
LED 1: Green LED 2: Off	1000 Mbps
LED 1: Green LED 2: Green	100 Mbps
LED 1: Off **LED 2: Green**	10 Mbps
On solid	Port Link
Random blinking	Port Link and Activity
Slow blinking	Error disabled
Rapid blinking	Port in Fast Setup Mode

SFP Status LEDs

State	Description
Green	Fiber link established
Green flashing	Link/activity
Off	No Link

Each SFP has a corresponding LED to indicate the current state of the fiber link.

Terminal Block Connectors

P1(+/-) — Power Input 1.
P2 (+/-) — Power Input 2.
Either P1 or P2 can power the unit. When both are connected, one will act as a backup.
IN(+/-) — Digital Input. Dry Contact.
Relay — Normally Open (NO) relay.

Installation

This chapter discusses the following topics:

General Cautions and Warnings

Warning: Power sources must be off prior to beginning the power connection steps. Read the installation instructions before you connect the unit to its power source.

Warning: Ensure that the voltage and current ratings of the intended power source are appropriate for the IDS switch as indicated on the product label.

Warning: Ensure that the installation and electrical wiring of the equipment is performed by trained and qualified personnel and that the installation complies with all local and national electrical codes.

Warning: Ensure that the unit is installed in a dry location. If installed outdoors, it should be installed in an enclosure which will ensure that the unit remains dry.

Warning: This unit should be installed in a restricted access location where access can only be gained by service personnel or users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken; and access is through the use of a tool or lock and key, or any means of security, and is controlled by the authority responsible for the location.

Warning: The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

Warning: If the unit is installed vertically in a living or office environment, the device must be operated exclusively in switch cabinets with fire protection characteristics in accordance with EN-62368-1

Warning: The working voltage inputs are designed for operation with Safety extra low Voltage (SELV). Connect only to SELV circuits with voltage restrictions in line with IEC/EN 62368-1.

Warning: If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Warning: In case of malfunction or damage, no attempts at repair should be made. Do not dismantle the product. All repairs need to be made by a qualified Perle representative.

Warning: For equipment installed within the same end-product enclosure ensure leads are segregated or insulate the leads from different circuits.

Grounding the IDS Switch

If your installation requires additional grounding, follow this procedure.

Grounding the chassis requires the following items:

• One grounding lug (not provided)
• One 12AWG wire (not provided)

Follow the manufacturers instructions for attaching the ground wire to the grounding lug.

The grounding lug can be found at the bottom of the IDS switch.

Attach the grounding lug to the chassis and secure with the grounding screw provided.

Connecting Power to the IDS Switch

The IDS switch has two power inputs that can be connected simultaneously to provide redundant power. If one power source fails the other source acts as a backup, and powers the switch

Wiring with suitable temperature ratings must be used. Refer to specification section for details. Use copper wire only if the terminal is only for connection to copper wire.

1. Ensure the power source is off prior to connection.
2. Strip both (12-20AWG) wires 7-8 mm(5/16th).
3. Loosen the terminal block screws and connect positive (+) / negative (-) wires into the +/- terminals.
4. Tighten terminal screws (0.5Nm torque). Ensure the wires are securely fastened.
5. Re-insert the Terminal Block connector if removed, Turn on power source. Check LED indicators in the guide for power status
6. Connect P2 (power source 2, beginning at Step 1)
7. Ensure that there is one individual conductor for each clamping point.

See *Terminal Block Connectors*.

Wiring the Relay Alarm

The IDS switch has a relay with a Normally Open (NO) terminal pair which supports a resistive load. The relay connections are located just to the left of the power terminal. They are the bottom two terminal connections. Using this, the IDS switch can be connected to an external powered device such as a siren or light for visual or audible notification of an alarm status.

1. Ensure the power source is off prior to connection.
2. Strip 2x12-20AWG (3.31 mm² -0.52 mm²) twisted pair copper wires 7-8 mm.
3. Loosen the terminal block screws and connect wires into the terminals.
4. Tighten terminal screws. Ensure the wires are securely fastened.
5. Re-insert the Terminal block connector if removed.
6. Turn on power source.

See *Terminal Block Connectors*.

Warning: Ensure power has been removed at the source of the alarm circuit prior to proceeding with connections to the alarm relay.
Warning: Ensure the voltage and current supplied by the alarm circuits are within the stated Alarm Relay specifications.

Wiring Digital Input

The IDS switch has a one Dry Contact digital input. This can sense a dry contact. On this terminal pair the IDS switch provides a voltage and current and can monitor the opening and closing of a dry contact switch.

To connect the digital input;
1. Ensure the power source is off prior to connection.
2. Strip 2x12-20AWG (3.31 mm² -0.52 mm²) twisted pair copper wires 7-8 mm.

3. Loosen the terminal block screws and connect wires into the terminals.
4. Tighten terminal screws. Ensure the wires are securely fastened.
5. Re-insert the Terminal block connector if removed.
6. Turn on power source.

See *Terminal Block Connectors*.

Connecting the Console Port

The IDS switch can be fully configured and managed from the console port. The console port provides a direct access to the Command Line Interface (CLI).

1. Connect a USB cable to the PC's USB port, then connect the other end of the cable to the IDS switch's micro-B USB connector.
2. Connect power to the switch as described in Connecting Power to the IDS Switch.
3. On the PC Choose Start -> Control Panel -> Systems (or equivalent) on the Windows Operating System, then open the Hardware tab. Choose the Device Manager, and expand the Ports section. The assigned COM port appears can be identified.
4. Start an terminal-emulation program (such as Putty or SecureCRT) on the com port where you have connect the cable to the PC.
5. Configure your COM port within the emulation program on the PC as:
   - 9600 baud
   - 8 data bits
   - 1 stop bit
   - No parity
   - None (flow control)
6. The PC will display the bootloader sequence.
7. Press Enter to display the setup prompt when the booting of the IDS is completed.

Connecting Data Ports

Ethernet Connections

By default all of the 10/100/1000 ports will automatically set themselves up to match the speeds of all attached devices. If auto negotiation is not supported by one or more attached devices, the ports can be configured to operate at fixed speeds and duplex settings.

Warning: In hazardous location installations, failure to remove the power from the source prior to completing the wiring connections to the Ethernet ports could cause an electrical arc resulting in a possible explosion.

To connect to 10Base-T, 100Base-TX or 1000Base-T follow these steps:
1. When connecting to devices, workstations, servers or routers connect a straight through Ethernet cable to a 10/100/1000 RJ45 connector on the front of the IDS switch. Gigabit Ethernet requires CAT 5e or better.
2. Once the device is connected and link is established the link LEDs will turn on. These LEDs will indicate whether you have a 10,100 or 1000 Mb/s link to the switch. See *Port Status Indicators* for more details.
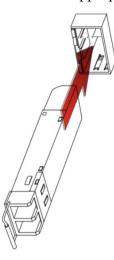
Note: It may take a few seconds for the device to become active. By default the IDS switch will have Rapid Spanning Tree (RSTP) protocol enabled. This protocol will first check the network for any cabling loops prior to bringing the port up, in order to prevent network disruptions.

SFP Connections

Inserting the SFPs

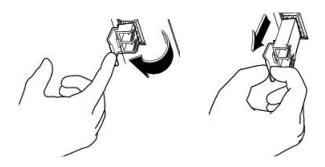SFP modules are inserted in the SFP slots on the front of the IDS switch.

1. Align the SFP module in front of the slot to establish alignment.
2. Insert the module and push inwards with your thumb until you hear a click. Do not force the SFP module in. SFP modules are keyed so you can only insert them one way.
3. If the SFP module is equipped with a clasp, ensure the clasp is in the locked position.The appropriate fiber cable can now be connected to the SFP module.

Removing SFPs

SFP modules are inserted in the SFP slots on the front of the IDS switch.

1. Disconnect the fiber cable from the SFP module.
2. If the SFP module is equipped with a clasp, move it to the unlocked position and use the clasp to pull the SFP towards you.
3. If the SFP module is not equipped with a clasp, then with your fore finger and thumb, firmly grip the SFP and pull towards you.

Resetting the Switch

The Reset/Fast Setup button is located near the bottom of the switch. A small tool such as a paper clip is needed to access the recessed button.

Soft Reset

To reset/restart the switch you can perform a soft reset. Press and immediately release the reset button to perform a soft reset.

LED	Behavior
PWR	The PWR LED will remain solid yellow during the boot process. Once the system software has been loaded the PWR LED will reflect the status of the power inputs.

Hard Reset

Hard Reset performs a power-off of the switch without requiring a disconnection of power. Once powered off, the switch can be powered back on by pressing the reset switch again or by disconnecting power at source and re-applying.

Press and hold the reset button for at least 8 seconds. The switch will perform a complete power down and stay in the powered off state. Press the reset button again to power the switch on.

LED	Behavior
ALL	All LEDs will be off after 8 seconds.

Reset to Factory Default Configuration

The switch can be reset to the Factory default configuration. When this is done, all configuration, user IDs, passwords and security certificates are deleted. The start-up and backup software are unaffected. Follow this procedure:

• Power off the switch
• Press and hold the reset button
• While continuing to hold the reset button, apply power to the switch
• When the PWR LED goes from RED to YELLOW, release the reset button.

The switch is now reset to factory default configuration.

Booting the Switch

When first applying power to the IDS switch, it will startup and go through the boot process. The LEDs will behave according to the table below.

LED	Behavior
PWR	Yellow during the booting process. Once the system software has been loaded, the PWR LED will reflect the status of the power inputs.
SYS	Green blinking — Boot process underway.

Fast Setup Mode

This allows you to perform initial configuration of the switch using your Web browser. Fast Setup Mode can be activated when the switch is in Factory Default. When started up in this mode, the switch assigns itself an IP address and also assigns an IP address to the connected PC. This makes it possible to initiate a Web session and the use of the Fast Setup configurator. Switches are shipped in Factory default mode. Refer to the Quick Start Guide that came with the switch for instructions on how to connect to the switch for the first time.

LED	Behavior
SYS	Press and hold the Reset/FS button. Release button when the SYS LED starts flashing.
Port Link / Speed	Rapid blinking on the first available RJ-45 port to which the PC can be connected.

Password Recovery

When the switch is not in factory default, the "Fast Setup Mode" sequence will activate Password recovery.
Note: The password recovery feature can be disabled in the software.

Configuring the IDS Switch

The IDS switch can be configured, operated and monitored using any of the following methods. See the IDS PoE Switches User Guide for more details.

CLI

A text-based Command Line Interface based on industry standard syntax and structure. The CLI can be accessed from the console port. Once a valid IP address is configured on the switch, Telnet, SSH or the Web interface can also be used to access the switch for administration purposes. See the IDS PoE Switches CLI Reference Guide for more information.

Web Device Manager

The Perle Web Device Manager is an embedded Web based application that provides an easy to use browser interface for managing the switch. This interface provides the ability to configure and manage the switch. This is accessible through any standard desktop web browser. Requires the switch to have a valid IP address.

Fast Setup

This utility provides the ability to do either an initial setup (out of the box) or a recovery setup. In order to use this utility a PC must be connected to one of the switches data ports and the function is activated using the reset button on the front panel. (See *Fast Setup Mode*)

SNMP

The switch can be managed with an SNMP compatible management station that is running platforms such as HP Openview or Perle's PerleVIEW NMS.

Appendix A - Technical Specifications

This appendix provides the technical specification for the IDS-710HP(-XT) switches.

Technical Specification	
Power	
Power Connector	• 4-Pin Removable Terminal Block • Grounding screw on metal chassis • Dual Power Input
Dual Power Input	• 54 VDC nominal 52-57 VDC (PoE++ IEEE 803.2bt Type 4), 9A Max. • 54 VDC nominal 50-57 VDC (PoE++ IEEE 803.2bt Type 3), 9A Max. • 54 VDC nominal 50-57 VDC (Poe+ IEEE 802.3at Type 2), 5A Max. • 48 VDC nominal 44-57 VDC (PoE 802.3af or IEEE 802.3at type 1), 3A Max.
Alarm Relay	• NO (Normally Open) • 1.0A @ 24VDC or 0.3A @ 48VDC (Resistive) • Requires Class 2/LPS or SELV circuit with Fuse protection
Digital Input	• IEC 61131-2 Type 3 Digital • Input • 24V, 2.25 mA

Rated Cable Temperatures
    IDS-710HP
    IDS-710HP710-XT
	>98° C
	>106° C

Overload Current Protection	Fuse
Reverse polarity protection	Yes
Interfaces	
RJ45 Ports	• 8 - shielded RJ45 • Up to 100 meters (328 ft.) • Auto-negotiation • Auto-MDI/MDIX Ethernet isolation 1500 V

Technical Specification	

RJ45 PoE/PoE+/PoE++ Ports
PoE Output
	Voltage: voltage will match input voltage.
	
	Power Output:
	PoE devices
	    Up to 15.4 Watts
	PoE+ devices
	    Up to 30 Watts
	PoE++ devices
	    Up to 60Watts (type 3)
	    Up to 100Watts (type 4)
	
	Amount of power available to a is dependent upon sufficient voltage and power being supplied to the switch.
	
	Note: Power output can be managed through software configuration.

SFP slot	• 2 SFP slots provided • Supports 1000Base-X and 2500Base-X SFP modules supplied by Perle, Cisco or other manufacturers of MSA compliant SFPs SFPs supporting SGMII protocol are also supported (example 1000Base-T)
Console port	• MicroUSB Type B female port - serial interface
Environmental Specifications	

Operating Temperature Ranges
    IDS-710HP
    IDS-710HP-XT
	
	-10° C to 60° C (14° F to 140° F).
	-40° C to 70° C (-40° F to 167° F)

Storage Temperature Range
    IDS-710HP
    IDS-710HP-XT
	
	-25° C to 75° C (-13° F to 167° F)
	-40° C to 85° C (-40° F to 185° F)

Operating Humidity Range	5% to 90% non-condensing
Storage Humidity Range	5% to 90% non-condensing
Operating Altitude	Up to 3,048 meters (10,000 feet)

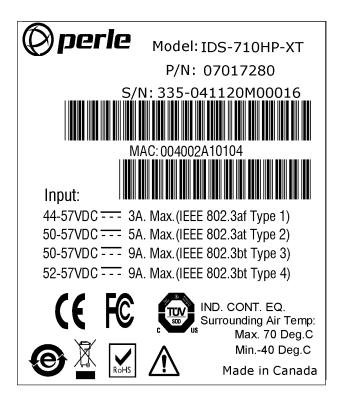| Technical Specification	
Standards and Certifications	
Standard Safety	CE Mark UL/ULC/EN 62368-1 (including CB) CAN/CSA C22.2 No. 62368-1-14
Industrial Safety	UL 61010-1 and UL 61010-2-201 (Standard for Safety for Programmable Controllers).
Emissions	FCC 47 Part 15 Class A, EN55032 (Class A) ICES-003 EN61010-6-4 (Emissions for Industrial Environments) CISPR 32:2015 / EN 55032:2015 (Class A) CISPR 24:2010/EN 55024:2010 EN61000-3-2
Immunity	CISPR 24 / EN 55024 CISPR 32 / EN55032 IEC/EN 61000-4-2 (ESD): Contact discharge +/- 4kV, Air Discharge +/- 8kV IEC/EN 61000-4-3 (RS) 80MHz-16Hz; 20v/m, 1.5kHz-2GHz; 10v/m, 2GHz-2.7GHz; 5v/m IEC/EN 61000-4-4 (EFT): DC power line +/- 2kV, Data Line +/- 1kV IEC/EN 61000-4-5 (Surge): DC power line, Line/Line +/- 1kV, Line/Earth +/- 2kV, Data Line line/earth +/- 1kV IEC/EN 61000-4-6 (CS):150MHz to 80MHz 10Vrms IEC/EN 61000-4-8 (Magnetic Field)30 A/M IEC/EN 61000-4-11 IEC/EN 61000-6-2 (General Immunity in Industrial Environments)
Laser Safety	Class 1 Laser safety requirements for those models with fixed fiber transceiver modules EN 60825-1:2007 FDA/CDRH 21 CFR1040.10 and 21 CFR1040.11
Environmental	Reach RoHS WEEE Compliant

Contacting Technical Support

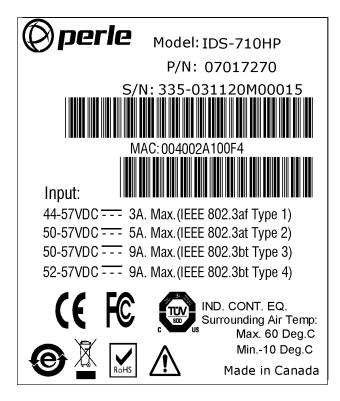Contact information for the Perle Technical Assistance Center (PTAC) can be found at the link below.

www.perle.com/support_services/support_request.shtml
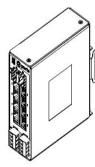
Warranty / Registration

This product is covered by the Perle Ethernet Switches Warranty. Details can be found at:

https://www.perle.com/support_services/warranty.shtml
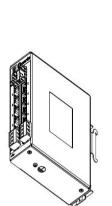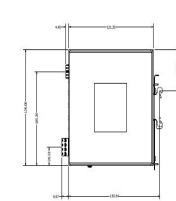
Appendix B - Sample Labels
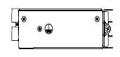
Appendix C - Mechanical Drawings

Appendix D - DIN Rail and Wall Mounting

This appendix provides instructions on the following:
- Mounting the IDS Switch on a DIN Rail
- Removing the IDS from the DIN Rail
- Wall Mounting the IDS

Mounting the IDS Switch on a DIN Rail

1. The DIN rail clip will be fixed to the back of the IDS unit when you receive the switch.
2. Position the IDS switch such that the top hooks of the DIN rail clip attach onto the top of the DIN rail.
3. Rotate the bottom of the IDS switch towards the rail. This will snap the bottom hooks of the DIN rail clip onto the bottom of the DIN rail.

Removing the IDS from the DIN Rail

1. The DIN rail attachment clip has a slot at the bottom of the latch that is visible beneath the switch when it is mounted.
2. Insert a flat blade screwdriver into the slot and twist the base to release the clip. Alternatively a downward force on the clip will release the clip.
3. When the clip is released, pull the bottom of the switch out slightly and remove the switch from the DIN rail.
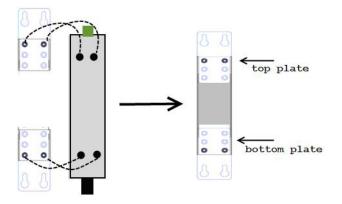
Wall Mounting the IDS

If you have purchased the optional wall mounting kit (Perle part number: 07010290) then proceed as below:
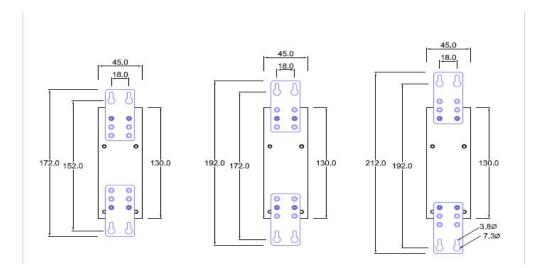
1. Remove the DIN rail clip from the rear panel on the IDS switch.
2. Attach the wall mount plates to the IDS switch as shown below using the screws provided in the kit.

3. Use the wall mount plates as a guide to mark the spot where the screws will be placed.
4. Drive the screws into the wall leaving about 2 mm of the screw protruding from the wall to allow room for sliding the wall mount panel between the wall and the screws.
5. Once the screws are fixed to the wall, insert the four screw heads through the large parts of the keyhole shaped screw openings
6. Pull the IDS switch down to lock the IDS switch to the wall mount.
7. Tighten the four screws securely to the wall.

Note: for best results use screws with the following attributes Head diameter .5 - .6 mm Shaft diameter 3 -3.5 mm

Appendix E - IDS Maintenance

- Ensure there is clearance of 50.8mm (2 inches) on all sides of the IDS switch to provide proper airflow through the unit
- Do not use solvents or cleaning agents on this unit
- Keep vent holes clear of debris
- If case gets dirty wipe with a dry cloth
- Ensure all cables are in good working condition
- Replace any frayed cables or cables without clips

Appendix F - Cables and Connectors

This appendix discusses the following topics:
* Ethernet cables
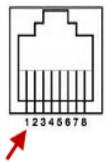* Ethernet Connector — 8 pin RJ45
* Connecting PoE devices

Ethernet Cables

The 10/100/1000BaseT(X) ports located on the IDS switch's front panel are used to connect to Ethernet-enabled devices. These Ethernet ports will automatically adjust depending on the type of Ethernet cable used (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.

Requirements:
* Cat 5 UTP or STP. Cat 5e cables are preferable when running 1000Mbps speeds.
* 24-22 AWG (0.20mm^2 - 0.33mm^2)
* Straight through or Ethernet Crossover cable

Ethnernet Connector - 8-pin RJ45

MDI Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

MDI-X Port Pinouts

Pin	Signal
1	Rx+
2	Rx-
3	Tx+
6	Tx-

Connecting PoE devices

- Supports IEEE 802.3af (Type 1) standards
  - For PoE devices up to 15.4 watts per port
- IEEE 802at-2009 (Type 2) standards
  - For PoE+ devices up to 30 watts per port
- IEEE 802bt (Type 3) standards
  - For PoE++ devices up to 60 watts per port
- IEEE 802bt (Type 4) standards
  - For PoE++ devices up to 100 watts per port

Connect the copper cables from each TP port(RJ45) on the IDS-710HP switch to compliant Powered Devices (PDs).