OSD NETWORKS

Operator Manual

OSD2183P / PW

Micro 10/100/1000Base-T to 100/1000Base-X Media Converter with IEEE802.3af/at/bt & PoH PoE Source

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1   TECHNICAL SUMMARY

1.1   BRIEF DESCRIPTION

1.1.1   OVERVIEW

The OSD2183P is a Power over Ethernet Gigabit Media Converter meeting the latest IEEE802.3bt PoE specification with continued support for devices requiring IEEE802.3af/at and HDBase-T (PoH) PoE. The fixed RJ45 ports is capable of providing 90W of power allowing the latest PoE devices such as IP cameras, Wireless Access Points, microwave links and VOIP phones to be easily connected to your network. With a compact design the OSD2183P can easily be mounted inside a network enclosure or a Smart Pole using the DIN rail or wall mounting brackets provided. Optionally, the OSD2183PW version can be powered from a 12VDC to 57VDC supply. A rugged IP30 casing, fanless design and wide operating temperature range from -40 to +75°C make this product ideally suited for use in a wide range of harsh industrial environments.

1.1.2   FEATURES AND BENEFITS

▲ Complies with IEEE802.3i/802.3u/ 802.3ab 10/100/1000Base-T, IEEE802.3u 100Base-Fx, IEEE802.3z 1000Base-Lx/Sx standards

▲ Has one fixed copper port and one 100Mbps/1000Mbps SFP port

▲ Auto MDI/MDIX on copper port (supports both straight through and crossover cables)

▲ Complies with IEEE802.3af/at/bt and HDBaseT (PoH) standards

▲ Provides up to 90W to the RJ45 port

▲ User selectable PoE mode setup via Push Button

▲ Powered by non-critical 46 to 57V_{DC} supplies for OSD2183P or 12 12 to 57V_{DC} for OSD2183PW (voltage booster version)

▲ Operates over the temperature range of -40°C to +75°C

▲ Supports 10KB jumbo frames

▲ User selected SFP module allows for a fiber link over 1 or 2 multimode or singlemode fibers over a range of distances up to 120km (over singlemode fiber)

▲ DIN rail or wall mounting

1.2 TYPICAL SYSTEM DESIGN

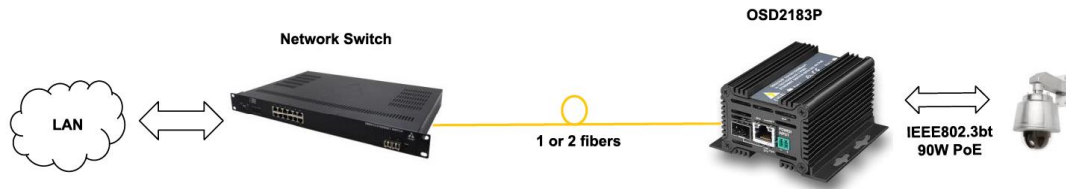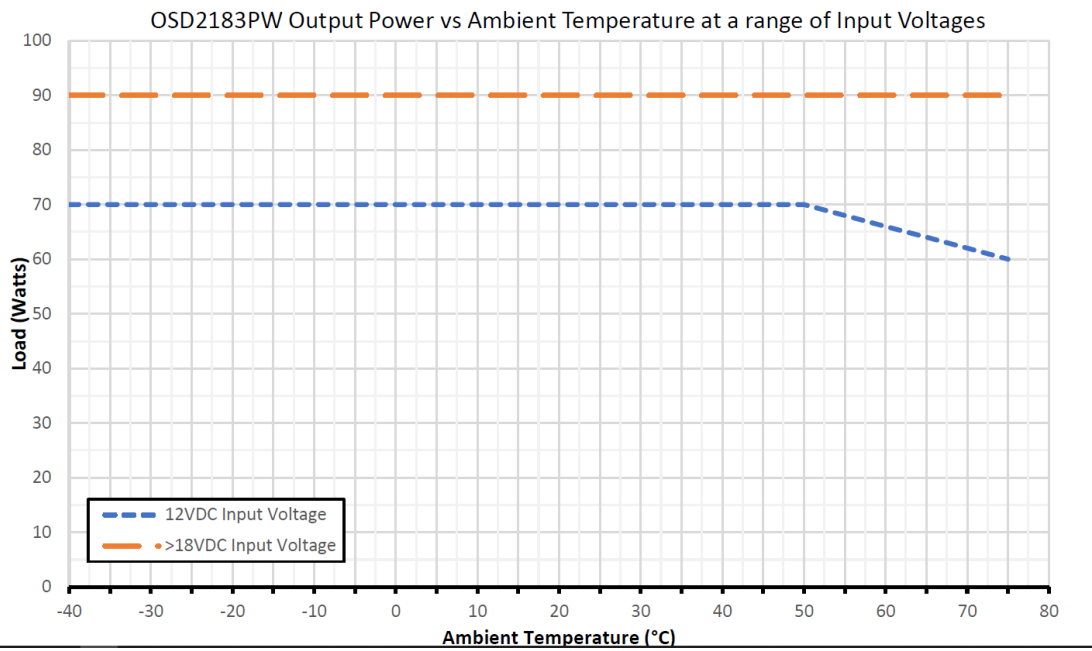Figure 1 below indicates a possible set-up for an OSD2183P/PW system.

FIGURE 1: TYPICAL SYSTEM DESIGN

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1.3 TECHNICAL SPECIFICATIONS

TABLE 1: TECHNICAL SPECIFICATIONS

Hardware	
Ethernet	1 x 10/100/1000Base-T RJ45, IEEE802.3i/802.3u/802.3ab
Jumbo Frame Support	10KB
SFP	1 x Gigabit SFP ports (100Mbps or 1000Mbps user selectable)
Optical Data Interface	IEEE802.3z 1000Base-Lx/Sx, IEEE802.3u 100Base-Fx
PoE (user configurable via GUI)	IEEE802.3af/at, IEEE802.3bt, PoH, bt legacy mode
Enclosure Protection Class	IP30
Installation	DIN rail, wall mount or desktop
DIP Switch	3 way DIP switch for configuration
Power Requirements OSD2183P	**Input Voltage**: +46V_{DC} to +57V_{DC} @ 8W +PoE output power for PD devices **Output PoE Voltage**: Vin - Vdrop
Power Requirements OSD2183PW	**Input Voltage**: +12V_{DC} to +57V_{DC} @ 15W +PoE output power for PD devices **Output PoE Voltage**: 56 to 57V - Vdrop
Output PoE Vdrop per port	PoE voltage drop per port <0.5V @ 30W, <1V @ 60W, <1.5V @ 90W
Power Connector	2 way 3.5mm terminal block
Indicators	1 x Copper Link on RJ45 1 x Copper Activity on RJ45 1 x PoE Power On/Off 4 x PoE Mode 1 x Power 1 x SFP Link/Speed on SFP
Environmental	-40 to +75ºC
Relative Humidity	0 to 95% non-condensing
Dimensions	90W x 88D x 49H mm
Weight	380g
Warranty	
Warranty Period	5 years
MTBF (Ground Benign Environment, 30ºC)	472,000 hours for OSD2183P 424,000 hours for OSD2183PW

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Maximum PoE Output Power with temperature derating

OSD2183PW Output Power vs Ambient Temperature at a range of Input Voltages
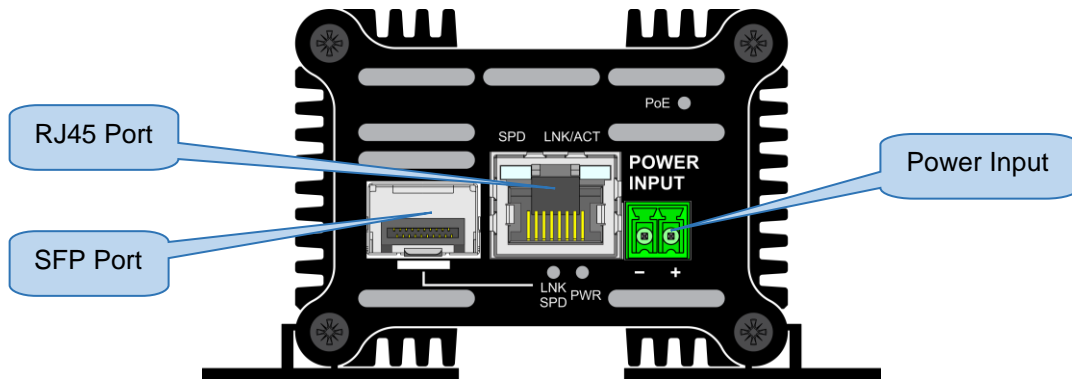
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1.4 FRONT / REAR PANEL LAYOUT

Front Panel: One fixed copper port for 10/100/1000Base-T, one SFP port and a 2-way terminal block power connector
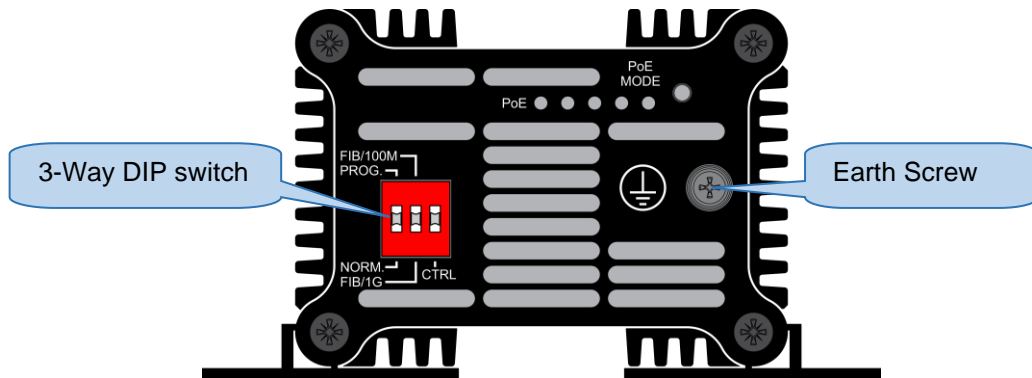
Rear Panel: 3-way DIP switch.

Front Panel

Rear Panel

FIGURE 2: PANEL LAYOUT

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2   INSTALLATION AND OPERATION

2.1   INTRODUCTION

This section outlines the methods required to install and operate the OSD2183P/PW successfully. It should be studied carefully if damage to the equipment or poor results are to be avoided.

This equipment has been fully tested prior to dispatch and is ready for immediate operation. However, it is advisable to check for external transportation damage before operation. If damage is evident, return the unit with the packaging to your supplier immediately.

2.2   INSTALLATION

2.2.1   WARNING AND PRECAUTIONS

▲ ELECTROMAGNETIC COMPATIBILITY

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

▲ OPTICAL OUTPUT OPERATION

WARNING: **Laser Safety:** Class 1 Laser Product per IEC/EN 60825-1:2014 standard.

Class 1
The OSD2183P/PW is a **Class 1 laser product.**
CLASS 1 LASER PRODUCT
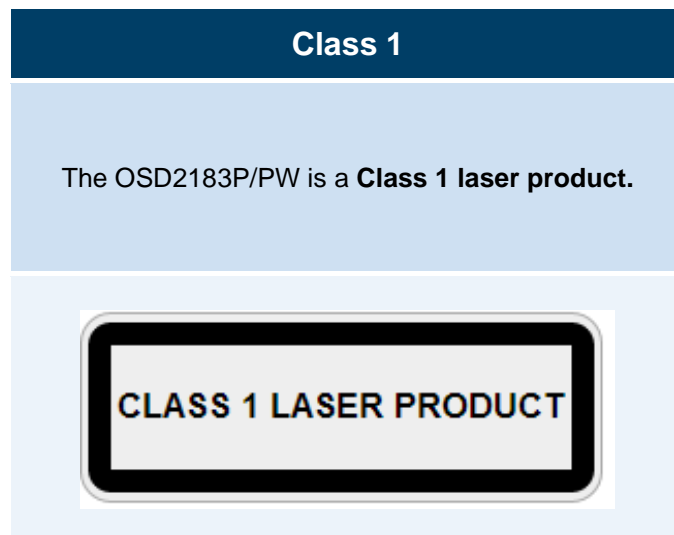
PRECAUTIONS

- ▲ All service personnel should be provided training as to the hazards of direct viewing of laser radiation and of the precautionary measures during servicing of equipment
- ▲ Areas where laser products are installed should be restricted in access to trained service personnel only and appropriate warning signs posted in the work area.
- ▲ All laser apertures should be covered by protective covers when not connected to optical fibers. Never leave outputs uncovered.
- ▲ Laser equipment should be positioned above or below eye level where possible. Apertures should be positioned away from personnel.
- ▲ Protective eyewear should be worn in the vicinity of laser equipment.

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2.2.2 DRAWINGS AND DIMENSIONS

The OSD2183P/PW is designed to be wall mounted onto a DIN-Rail (35mm top hat) fixture or by using 4 x M4 captivated screws (DIN Rail mount requires removal and flanges repositioned – see below). The unit dimensions (excluding connectors, SFPs, etc) is shown in below.
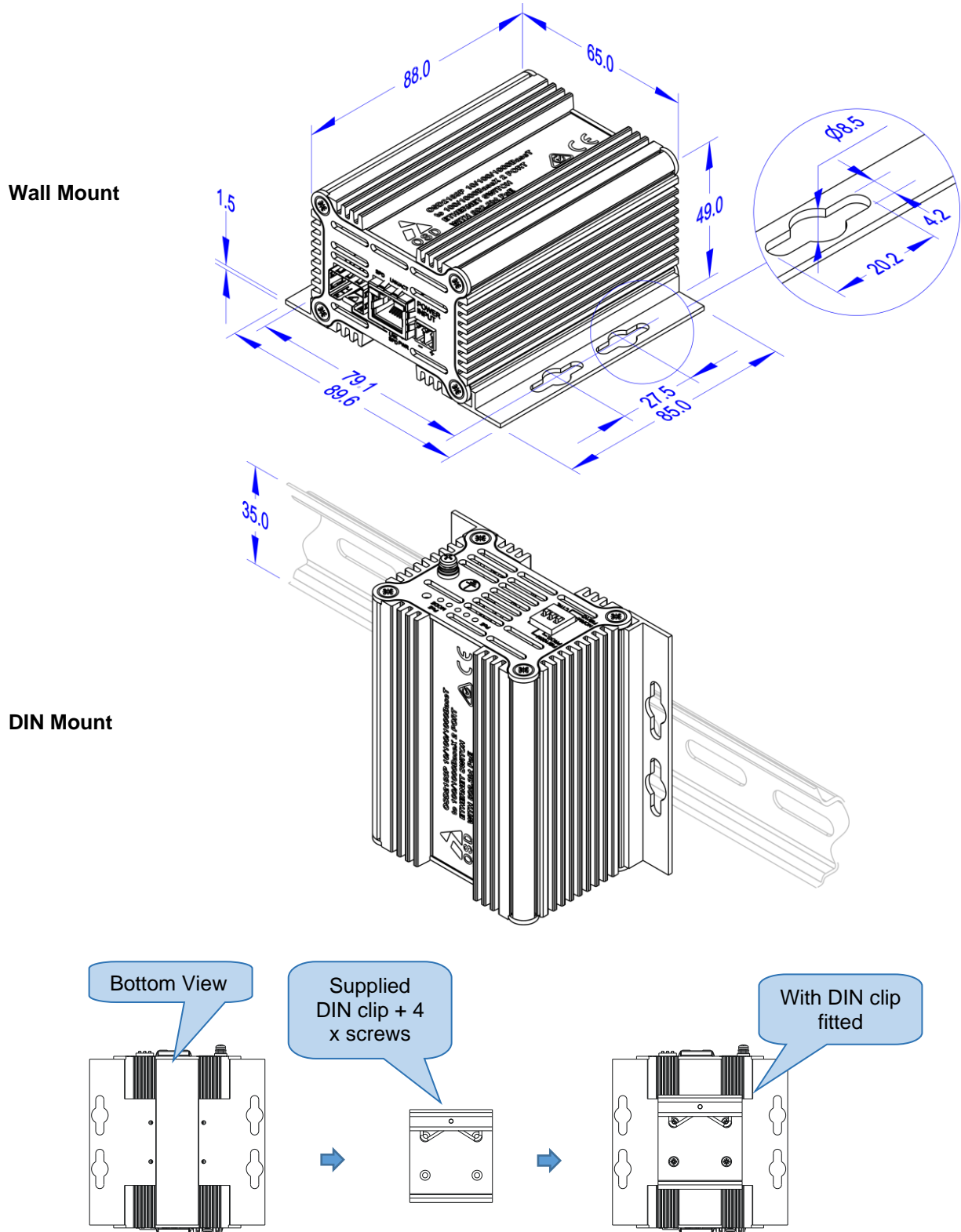
Wall Mount

DIN Mount

Bottom View

Supplied DIN clip + 4 x screws

With DIN clip fitted

FIGURE 3: MOUNTING DIMENSIONS

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2.2.3 LOCATION

As with any electrical device, the OSD2183P/PW should be placed where the switch will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site selected should meet the following requirements:

- The ambient temperature should be between -40°C to 75°C.
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- Make sure that the switch receives adequate ventilation. Do not block the ventilation holes on any side of the switch.

Note: Without proper cooling and control (lowering) of ambient temperature, the components within the OSD2183P/PW can be subject to increased heat shortening the longevity and reliability. It is thus good engineering practice to ensure the unit is installed in a well-ventilated area.

2.2.4 POWER SUPPLY CONNECTIONS

IMPORTANT! There are two options available for the OSD2183P: The OSD2183P and OSD2183PW. The Table below (Table 2) indicates the power requirements for each. They both require external DC power which is connected via the 2-way terminal block located on the front panel as shown in Figure 4.

CAUTION ⚠️	It is highly recommended to wait about 30 seconds before reconnecting the PD after the PD has been disconnected from the unit. This will prevent a high inrush current being applied to the unit. Although the OSD2183P/PW has a high inrush current tolerance (400mA for 50 to 75ms as per the IEEE802.3at standard), inrush currents higher than 1.5A may damage the device.

TABLE 2: POWER CONNECTION

OSD Version	External Power Pin	Specification
OSD2183P	+	$+46V_{DC}$ to $+57V_{DC}$ @ 8W
OSD2183PW	+	$+12V_{DC}$ to $+57V_{DC}$ @ 15W
	-	0V
	⏚	Chassis Ground connection point

*$\geq 52V_{DC}$ recommended for PoE+ or $\geq 55V_{DC}$ for 60W PoE
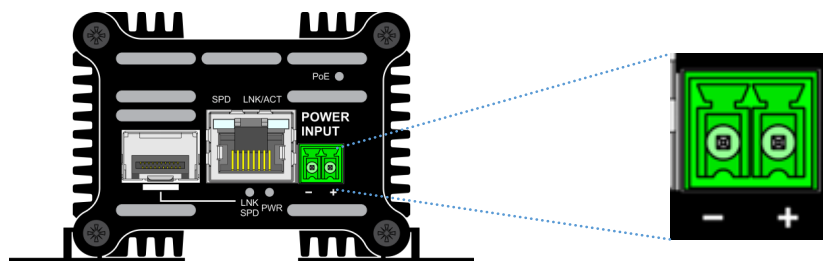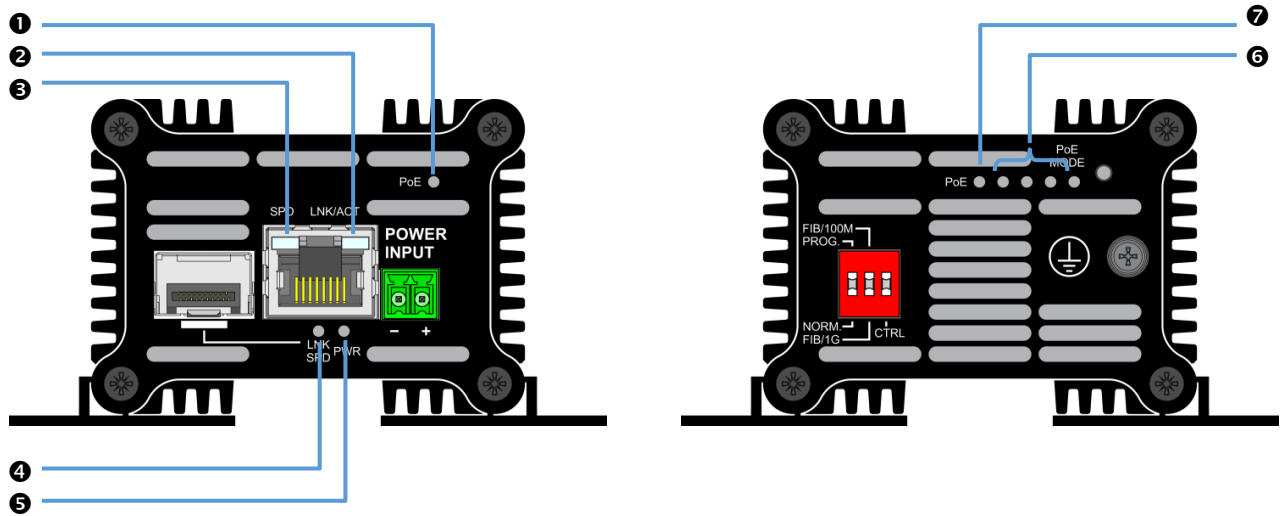

Front Panel

FIGURE 4: POWER SUPPLY CONNECTIONS

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2.2.5 LED INDICATORS

FIGURE 5: PORT/LED

TABLE 3: LED FUNCTION

No	Indicator	LED Colour	On		Off	Blinking
❶	PoE	Green[1]	PoE Enable		No PoE	Invalid Device[2]
❷	LNK/ACT	Amber	Copper Link Activity		No Copper Link	Activity[3]
❸	SPD	Green	Copper Speed	1Gbps	10/100Mbps	-
❹	LNK SPD	Amber	Fiber Speed	100Mbps	No Optical Link	-
		Green		1Gbps		
❺	PWR	Green	Power On		Power Off	-
❻	PoE Mode	Green	See Table 5		See Table 5	-
❼	PoE	Off	N/A		N/A	N/A

Notes: [1] When PoE LED is on it indicates that the unit is supplying power to the PSE
[2] Invalid device – No PoE output
[3] Activity indicates traffic for copper port

2.2.6 CONTROLS

The OSD2183P/PW has a number of control functions: a 3-Way DIP Switch and a PoE Mode push button.
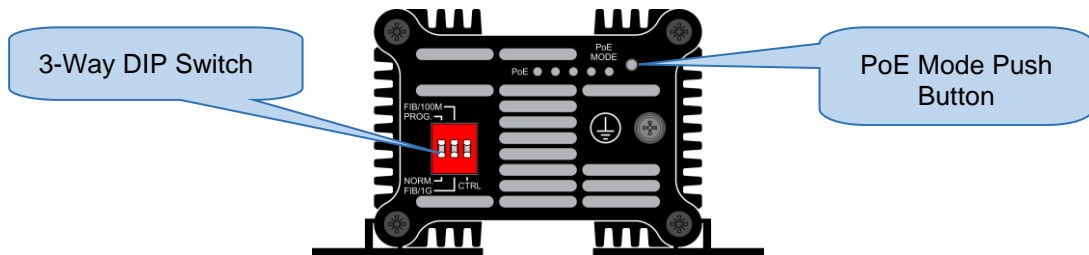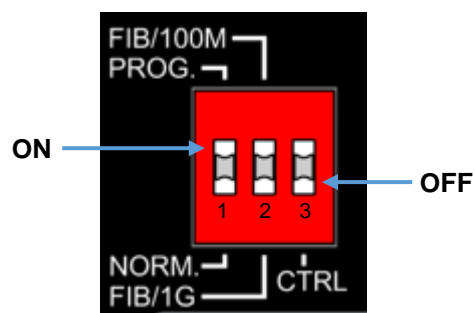

FIGURE 6: CONTROLS

FIGURE 7: 3-WAY DIP SWITCH

TABLE 4: 3-WAY DIP SWITCH SETTINGS

SWITCH NUMBER	DESCRIPTION	SWITCH POSITION	FUNCTION
1	Not In Use	OFF	User Mode*
		ON	-
2	Optical Port Speed	OFF	1000BASE-X*
		ON	100BASE-X
3	CTRL	OFF	PoE Disabled
		ON	PoE Enabled*

* Default settings.

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PoE Mode Push Button

The PoE Mode push button is used to control the PoE settings. Pressing the push button will cycle through the different modes as set out in the table below.

TABLE 5: POE MODE

LED NUMBER	DESCRIPTION	MODE	FUNCTION
1	●○○○	BT Mode	4 Pair power output, 90W Max, High Inrush Current Mode off
2	○●○○	PoH Mode	4 Pair power output, 90W Max, High Inrush Current Mode off
3	○○●○	BT Mode	2 Pair power output, 30W Max, High Inrush Current Mode off
4	○○○●	Custom Mode	There are no customized settings - this mode will be skipped.

2.2.7   FITTING SFP CONNECTORS

Care should be taken when inserting/removing the SFP connectors from SFP port as SFP modules are Electrostatic (ES) sensitive and Electrostatic Discharge (ESD) precautions should be taken when installing. Ensure that the SFP is fully engaged and latched into position.

Inserting SFP – Ensure that the SFP lever is in the locked position and insert into appropriate SFP port. Gently push the SFP until it locks into place. Remove plastic/rubber dust cap and fit fiber cable or RJ45 plug.

Removing SFP – Remove fiber connector or RJ45 plug. Pull the SFP lever down to unlock SFP from housing. Using the lever, gently pull the SFP out.
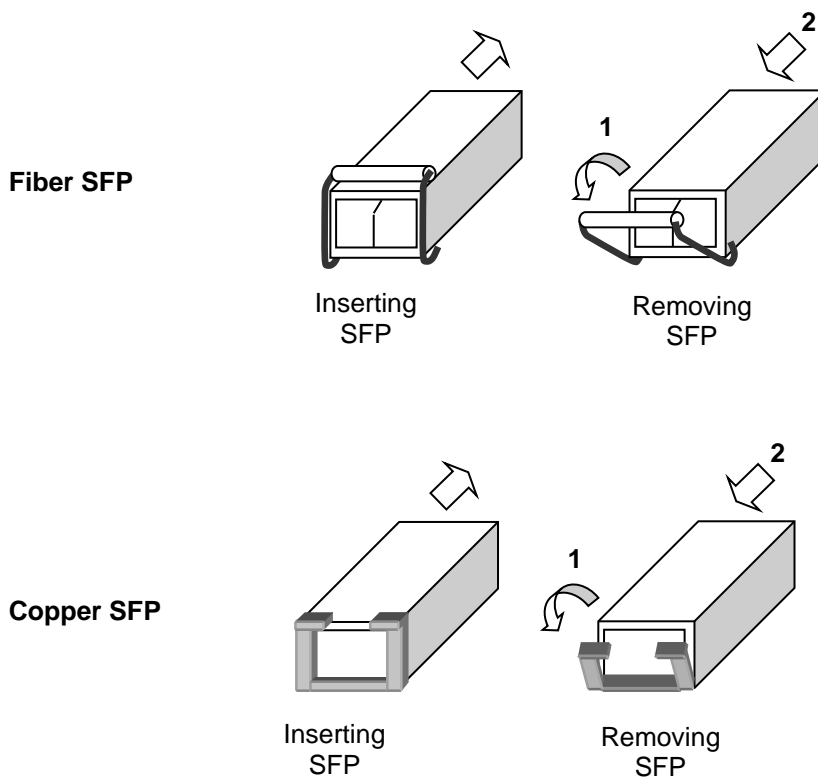
Fiber SFP

Inserting
SFP

Removing
SFP

Copper SFP

Inserting
SFP

Removing
SFP

FIGURE 8: FITTING/REMOVING SFP CONNECTORS

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2.3 SINGLE/DUAL SIGNATURE PD OPERATION

The OSD2183P/PW supports single, dual or either single/dual signature PD by automatically detecting the user PD signature.

2.3.1 SINGLE SIGNATURE PD

A "single signature PD" shares the same detection signature, classification signature, and maintains power signature between both pair sets.
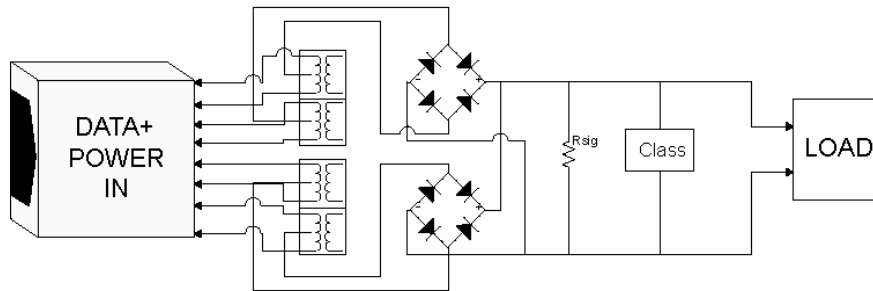

FIGURE 9: SINGLE SIGNATURE PD

2.3.2 DUAL SIGNATURE PD

A "dual signature PD" has independent detection signatures, classification signatures, and maintains power signatures on each pair set. It enables the load to work with two pair PSEs eg. A surveillance camera built with dual signature PD can have one pair connected to the camera and the other pair to a fan or heater. Note that dual signature PDs require two parallel PD interfaces, one for each pair set, where the power from the two PSEs are summed after each PD interface ie Camera (25W) + fan (10W) = 35W from one port.
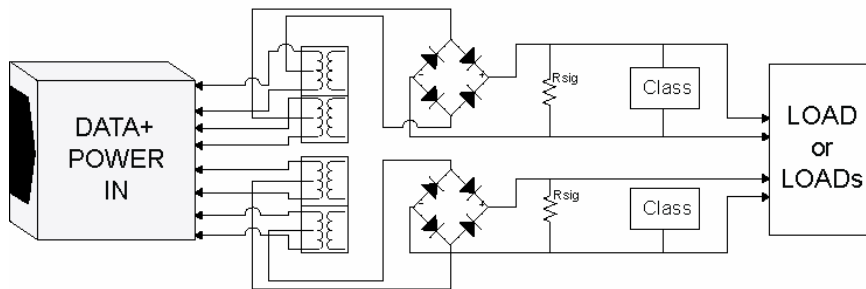

FIGURE 10: DUAL SIGNATURE PD

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2.4 OPERATION

When using the OSD2183P/PW for the first time, check that the unit is in good condition with no visible damage.

Upon power up check that the indicators illuminate accordingly on power up (see Table 3).

2.4.1 CONNECTIONS

For RJ45 connection use Category 5 (CAT5) or higher. Length should be no more than 100 meters.

For singlemode fiber connections, fiber used must be 9/125µm singlemode fiber.

For multimode fiber connections, fiber used must be 50/125µm or 62/125µm multimode fiber.

Plug in the appropriate connectors for system configuration;

– RJ45 cable to fixed copper ports (port 1 and 2) and copper SFP modules
– LC or SC fiber cable to fiber SFP modules.

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3 MAINTENANCE

3.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD2183P/PW modems. Please take note of the following:

▲ Personnel without appropriate training should not attempt any maintenance except that outlined below.

▲ If further maintenance is attempted you are warned that every care should be taken to ensure that internal measurements made while the equipment is operational are taken carefully as some components within the unit are expensive and may be damaged by failure of any portion of their support circuitry.

▲ Some components within the unit are Electrostatic (ES) sensitive and Electrostatic Discharge (ESD) precautions should be taken when performing maintenance upon the unit.

3.2 EXTERNAL INSPECTION

Visually check for the following:

▲ Check that the correct power source is connected to the power socket.

▲ Check that the Ethernet cables are connected to the modem correctly and that the distant OSD2183P/PW modem has been connected correctly to any external equipment.

▲ Inspect the optical connectors (for fiber SFP option) for any contamination and clean using isopropyl alcohol and a lint free tissue if any contamination is detected.

3.3 ROUTINE MAINTENANCE

▲ There is no routine maintenance required with the OSD2183P/PW.

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4 WARRANTY

Thank you for purchasing equipment designed, manufactured and serviced by Optical Systems Design (OSD). OSD warrants that at the time of shipment, its products are free from defects in material and workmanship and conforms to specifications. Our Warranty conditions are outlined below:

4.1 WARRANTY PERIOD

For warranty period, please contact your local OSD distributor.

4.2 REPAIRS

Optical Systems Design reserves the right to repair or replace faulty modules/units. Please obtain a "Return Material Authorisation" (RMA) form and number before returning goods.
Goods must be returned in adequate packing material to Optical Systems Design, Warriewood or its nominated authorised representative, for all repairs.

4.2.1 WARRANTY REPAIRS

Return shipments to OSD shall be at customer's expense and freight back to the customer will be at OSD expense.

4.2.2 OUT-OF-WARRANTY REPAIRS

OSD reserves the right to repair or replace any faulty goods. Freight costs and insurance for both journeys are met by the user. All equipment repaired by OSD will have a 3-Month Warranty from the date of dispatch.

4.2.3 SITE REPAIRS

By agreement site repairs may be undertaken for which out of pocket, hotel and travel expenses will be charged.

4.2.4 EXCLUSIONS

This warranty does not apply to defects caused by unauthorized modifications, misuse, abuse or transport damage to the equipment. All modifications to OSD's standard product will need written authorization and will be charged at normal repair rates. All modifications are to be carried out by OSD Technicians. Warranty is void if unauthorized removal and/or tampering with serial number and/or repair labels is evident.

Printed in Australia