
OPTICAL

SYSTEMS

DESIGN

OPERATOR MANUAL

OSD2975

20 - 57VDC GIGABIT ETHERNET

PoE++ INJECTOR

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1 TECHNICAL SUMMARY

1.1 BRIEF DESCRIPTION

1.1.1 OVERVIEW

The OSD2975 is an in-line mid-span power injector that allows a powered device (PD) to draw up to 60W from an Ethernet cable. The power injector does not affect the data path. Signal transmission and isolation characteristics of existing equipment and cabling are preserved. The OSD2975 injector has IEEE802.3af/802.3at/PoE++ compliant Power Sourcing Equipment (PSE) controller that supports Type2 PoE systems. The OSD2975 PSE output is protected for short circuit, under-voltage, and overvoltage conditions. Inrush current is limited and there is a thermal shutdown. The OSD2975 will not apply power unless it detects a valid PD signature.

1.1.2 APPLICATIONS

- ▲ Networks using Power over Ethernet devices such as PTZ IP cameras, intercoms, access control, telephones, variable message signs, WiFi access points etc
- ▲ PoE power distribution for Telco 4G and 5G wireless access points
- ▲ Power over Ethernet in 10/100/1000Base-T networks

1.1.3 FEATURES AND BENEFITS

- ▲ PoE PSE compliant to IEEE 802.3af/at and PoE++
- ▲ Small and robust module powered by a range of DC power sources
- ▲ Supports network speeds up to 1000Mbps.
- ▲ DIN rail or surface mounting
- ▲ Optionally available with single and dual PD signature detection
- ▲ Operates over the temperature range of -40 to +75°C
- ▲ Powered from 20 to 57V_{DC} sources
- ▲ Plug and play operation

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1.2 TYPICAL CONFIGURATION

Figure 1 below indicates the typical set-up for an OSD2975 system.

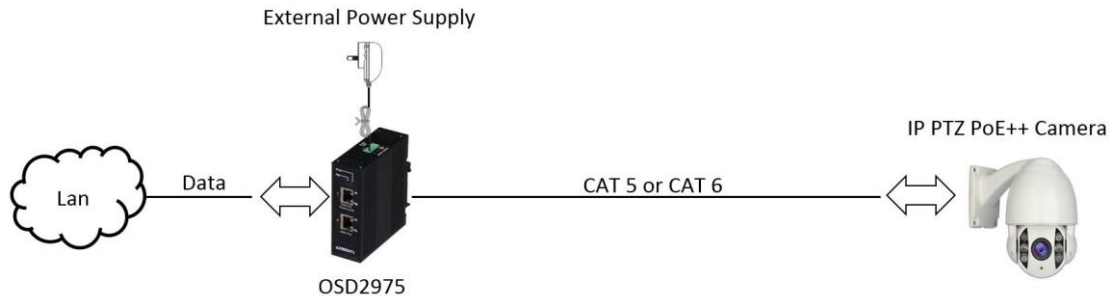


FIGURE 1: OSD2975 TYPICAL CONFIGURATIONS

1.3 TECHNICAL SPECIFICATIONS

TABLE 1: TECHNICAL SPECIFICATIONS

SPECIFICATION	PERFORMANCE
Electrical Data Interface	IEEE802.3af / 802.3at/PoE++
Electrical Data Rate	10, 100, 1000Mbps
Electrical Data Connector	RJ45
PoE PSE	Alternative A (Pins 1/2 and 3/6) and Alternative B (pins 4/5 and 7/8)
PoE Power	60W Maximum
Reverse Polarity Protection	Included
Operating Temperature Range	-40°C to +75°C
Relative Humidity	0 to 95% non-condensing
Power Requirements	20 to 57V _{DC} @ 3W with no PD power consumption 20 to 57V _{DC} @ 68W with 60W PD power consumption
Power Connector	3 Way 5.08mm Terminal Block: V-, V+ and Case Ground
Dimensions (mm)	25W x 89D x 80H excluding connectors
Weight	0.4kg (module)

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2 INSTALLATION AND OPERATION

2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD2975 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 OSD2975 DRAWINGS AND DIMENSIONS

The OSD2975 is designed to be mounted on an even surface or to be secured onto a DIN rail.

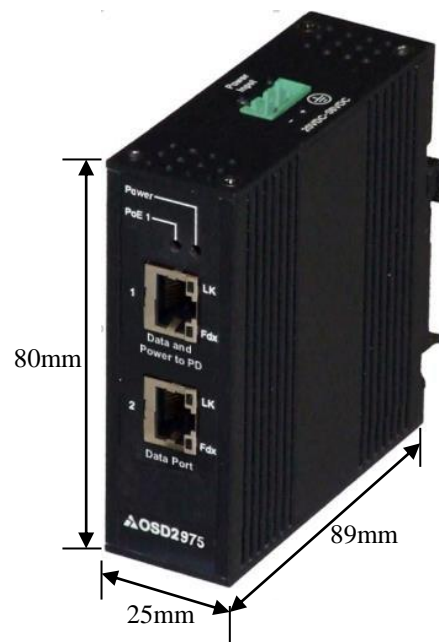


FIGURE 2: OSD2975 MOUNTING DIMENSIONS

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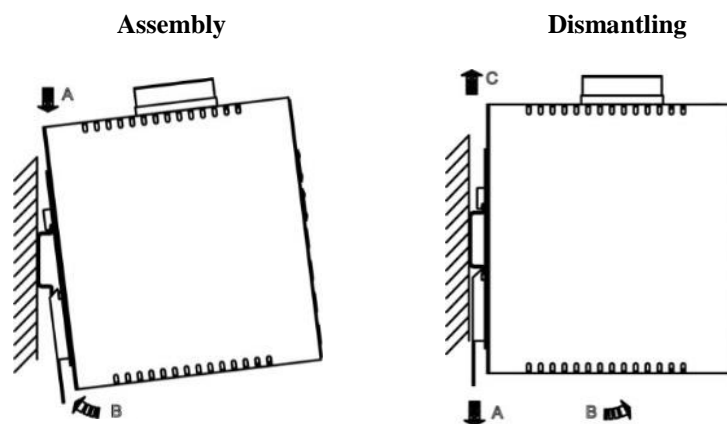
2.2.2 DIN RAIL INSTALLATION

DIN-Rail assembly, startup, and dismantling

Assembly: Place the unit on the DIN rail from above using the slot. Push the front of the Switch toward the mounting surface until it audibly snaps into place.

Startup: Connect the supply voltage to start the switch via the terminal block. *See power requirement section before connecting power!*

Dismantling: Pull out the lower edge and then remove the Switch from the DIN rail.



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2.2.3 FRONT AND TOP PANELS

The front panel consists of an RJ45 Gigabit Data/PoE Port, a RJ45 Data port and two LED indicators. Each section will be described further throughout this manual.

The top panel consists of the 3-way terminal block for power input, two control switches and a chassis grounding screw point. *See power requirement section before connecting power!*

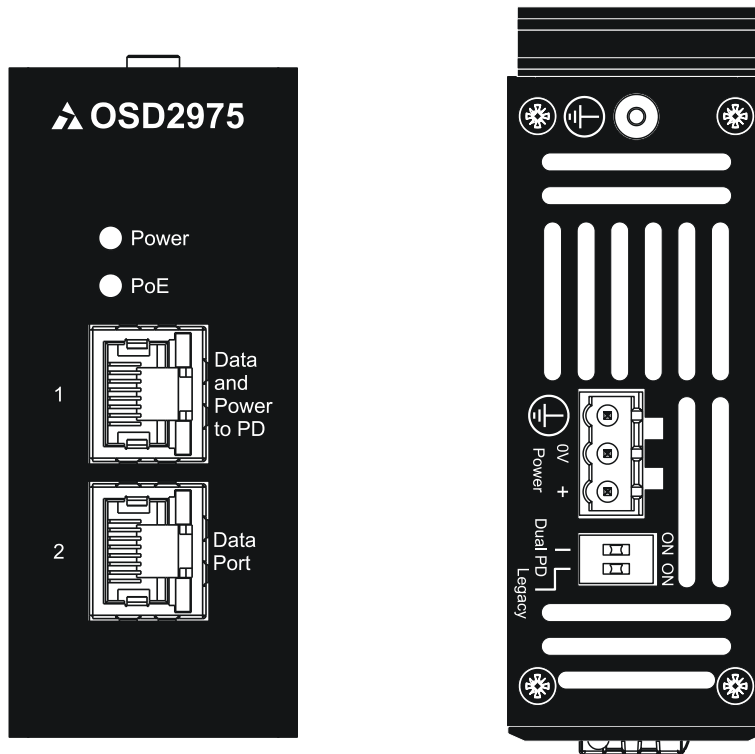


FIGURE 3: FRONT AND TOP PANELS

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2.2.4 POWER SUPPLY CONNECTIONS

The OSD2975 requires external DC power with a voltage range of $20V_{DC}$ to $57V_{DC}$ @ 3W with no PD power consumption or $20V_{DC}$ to $57V_{DC}$ @ 68W with 60W PD power consumption. This must be an isolated floating power supply source that is not shared with other equipment.

Power should be connected to the 5.08mm terminal block located at the top of the case as indicated in Table 2.

Note: Earth ground on the 3-way terminal block (pin 3) is also internally connected to the earth ground screw point. Both are marked as \oplus .

TABLE 2: DC POWER CONNECTION

External Power Pin	Specification
Pin 1	20 to $57V_{DC}$ @ 3W (no PD power consumption) 20 to $57V_{DC}$ @ 68W (60W PD power consumption)
Pin 2	0V
Pin 3	\oplus

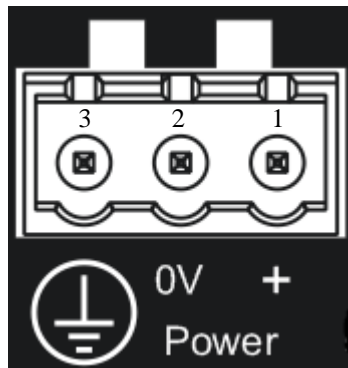


FIGURE 4: POWER SUPPLY CONNECTIONS

2.2.5 LED INDICATORS

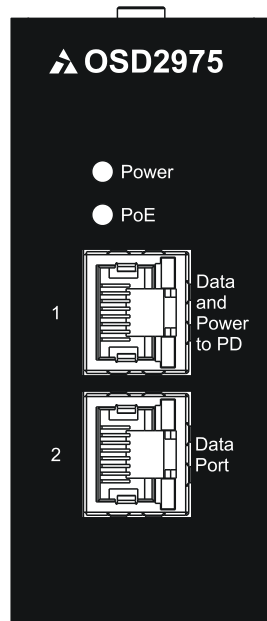


FIGURE 5: LED INDICATORS

TABLE 3: LED FUNCTION

LED	Function	
	On	Off
Power	Power Connected	No Power Connected
PoE	PD enabled	No PoE device detected

2.2.6 CONTROL (SWITCH) SETTINGS

There are two switch controls located on the top of the OSD2975: Dual PD and Legacy. Toggling the switch in the ON position enables the functions. Note: The switch settings need to be made before the unit is powered on to take effect. Toggling the switches while the unit is on will not change the setting.

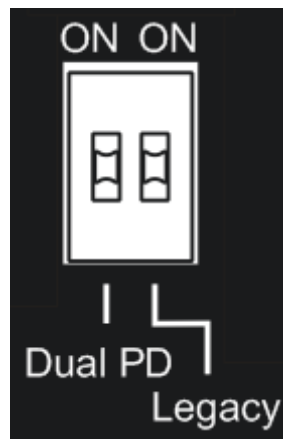


FIGURE 6: CONTROL SWITCHES

Dual PD

Single and Dual Signature PD control is available on Port 1 of the RJ45 connector (Data and Power to PD port). When disabled (down or off) position, the unit is in Single Signature PD mode. When enabled (On) position, the unit is in Dual Signature PD mode. See section 2.3 for detailed Single/Dual signature terminology.

Legacy

Legacy mode simply detects and powers pre-IEEE specification PDs. Proprietary PDs that predate the original 802.3af standard are commonly referred to as legacy PDs. A PSE that detects legacy PDs are technically non-compliant with the IEEE specification standard. The OSD2975 can be configured to detect this type of legacy PD when the control switch is enabled (ON position).

When the legacy mode is enabled (ON) and a valid detection signature is presented, 13W is allocated to ensure pre-802.3af PDs receive sufficient power thus the OSD2975 ensures full legacy PD support.

When the Legacy control switch is off (down position), legacy mode is disabled. Only PDs presenting compliant IEEE PoE and PoE++ PDs are considered valid.

2.3 OSD2975 SINGLE/DUAL SIGNATURE PD OPERATION

The OSD2975 supports single and dual signature PD in Port 1 which is controlled by the control switch.

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.

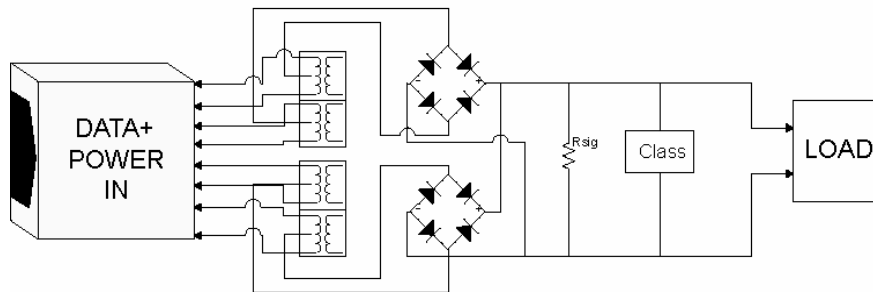


FIGURE 7: SINGLE SIGNATURE PD

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.

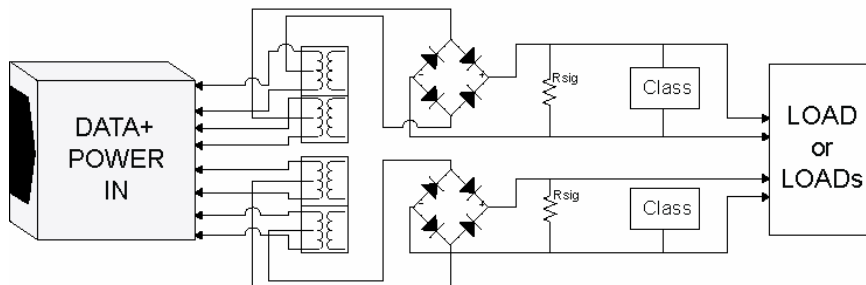


FIGURE 8: DUAL SIGNATURE PD

2.3.3 BASIC CONNECTIONS

Figure 9 shows basic user connections to the OSD2975

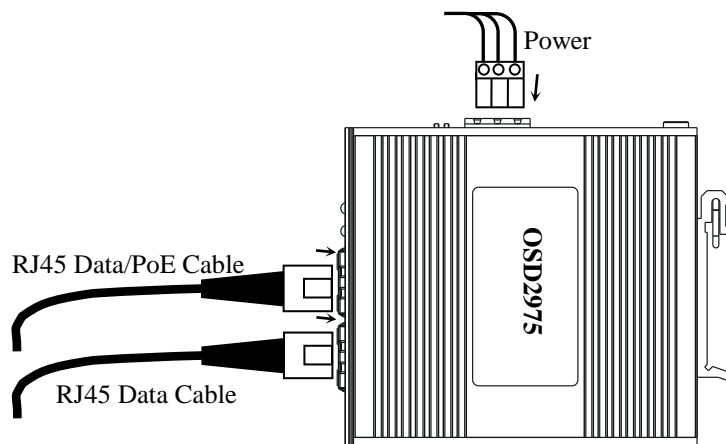


FIGURE 9: BASIC CONNECTIONS

3 MAINTENANCE

3.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD2975 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 OSD2975 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 OSD2975.

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 call 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.

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A.B.N. 83 003 020 504

Printed in Australia