OPTICAL
SYSTEMS
DESIGN

OPERATOR MANUAL

OSD2054P SERIES

10/100Base-T to 100Base-X

3-PORT SWITCH with PoE SOURCE

INDEX 1

1 TECHNICAL SUMMARY

1.1 BRIEF DESCRIPTION

1.1.1 OVERVIEW

The OSD2054P is designed to convert between 10/100Base-T copper cabling and 100Base-X fiber cabling. It has two RJ45 copper ports one of which supports PoE and one SFP port which can be specified by the user for one or two fiber configuration.

The unit will operate on either singlemode or multimode fiber. Operation over at least 2km of multimode fiber or up to 160km of singlemode fiber is possible by use of the appropriate optical device.

A major benefit of the OSD2054P is its reliable operation over the -20°C to +75°C temperature range which allows it to be used in environments such as roadside cabinets, mine sites and factories.

The OSD2054P module is intended for isolated use and requires an external power source.

1.1.2 APPLICATIONS

- Any network utilising a mix of copper and fiber
- Extremely space constrained environments
- Industrial IP communications
- Networks using Power over Ethernet devices such as cameras, intercoms, access control, telephones, etc

1.1.3 FEATURES AND BENEFITS

- Two 10/100Base-T RJ45 ports and one SFP fiber port
- Supports IEEE802af Alternative B cable wiring on one RJ45 port
- Complies with IEEE 802.3af standard including compliant powered device (PD) signature detection and classification
- Provides up to 15.4W from port 1 only
- Supports network traffic of 10 or 100Mbps
- Auto MDI/MDIX
- Automatic TP setup: no need for crossover cables
- Auto-sensing of half or full duplex operation.
- Automatic setup for 10 or 100Mbps on copper side
- Available for singlemode, multimode operation over a variety of link budgets
- Available for operation over 1 or 2 fibers
- Powered by non-critical 10 to 36VDC supply, 48VDC supply optional
- Operates over the temperature range of -20 to +75°C
- A very compact design that fits in the camera housing
- Utilizes 100Base-X SFP transceivers that can be selected according to specific length or fiber requirements without changing the whole unit.
- DIN rail mounting
- SFP sold separately

1.2 TYPICAL CONFIGURATION

Figure 1 below indicates the typical set-up for an OSD2054P system.

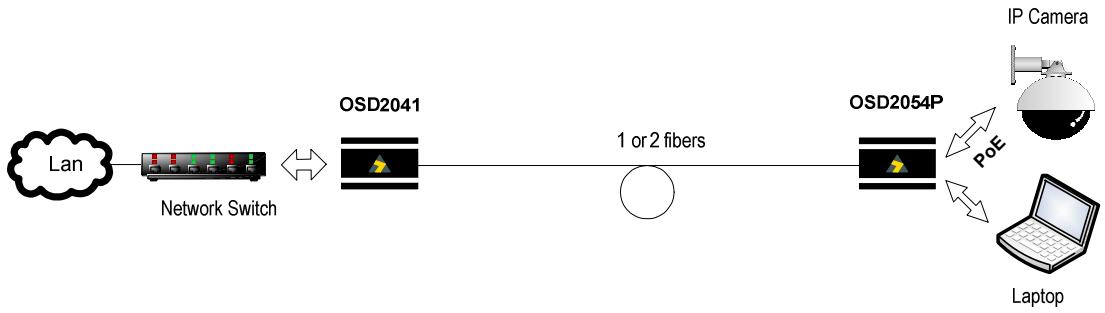


FIGURE 1: OSD2054P TYPICAL CONFIGURATIONS

1.3 TECHNICAL SPECIFICATIONS

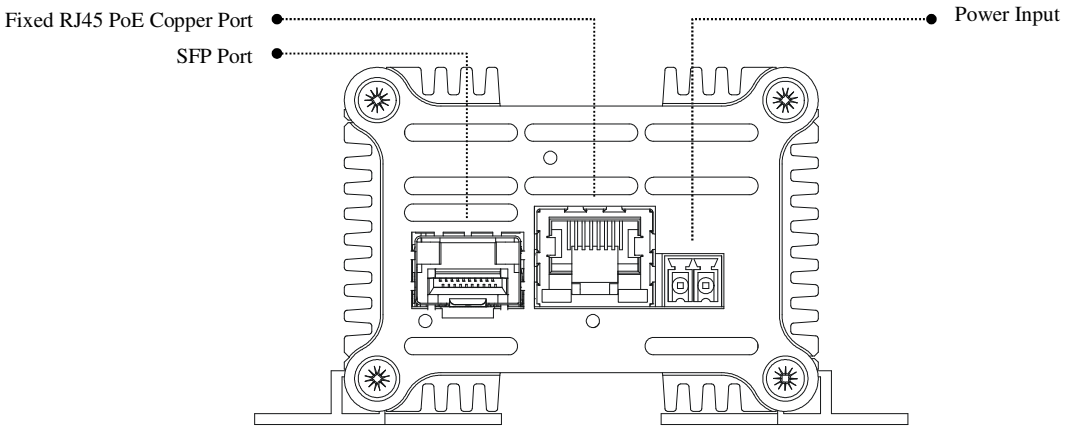
TABLE 1: TECHNICAL SPECIFICATIONS

SPECIFICATION	PERFORMANCE
Electrical Data Interface	IEEE802.3 Ethernet
Electrical Data Rate	10/100Mbps
Operating Mode	Half or Full Duplex
Data Connector	RJ45, the PoE unit mounted on the front panel and the non-PoE unit on the rear panel
PoE	IEEE802.3af
Operating Modes	Alternative B (pins 4/5 and 7/8)
Optical Interface	100Base-Fx/Sx
Optical Port Connector	SFP (LC connectors for 2-fiber operation and SC for 1-fiber operation)
SFP Options	Short haul, long haul, single fiber operation, etc Please consult OSD datasheet #1021000XX or contact OSD
Transmit Optical Power	-15 to -8dBm into singlemode fiber (See SFP datasheet for details)
Receiver Sensitivity	<-33dBm
Receiver Saturation	>-3dBm
Standard Optical Link Budget	>18: >10km on multimode fiber @1310nm > 40km on singlemode fiber @ 1310nm > 160km possible on singlemode fiber with optional SFP
Operating Temperature	-20°C to +75°C
Relative Humidity	0 to 95% non-condensing
Power Requirements	+10V_{DC} to +36V_{DC} @ 3W plus an extra 20VA for PoE operation (Attached powered device dependent). Use of isolated power supply is recommended
Power Connector	3.5mm 2-Way Terminal Block on the module
Dimensions (mm)	90W x 58D x 49H
Weight (kg)	0.4

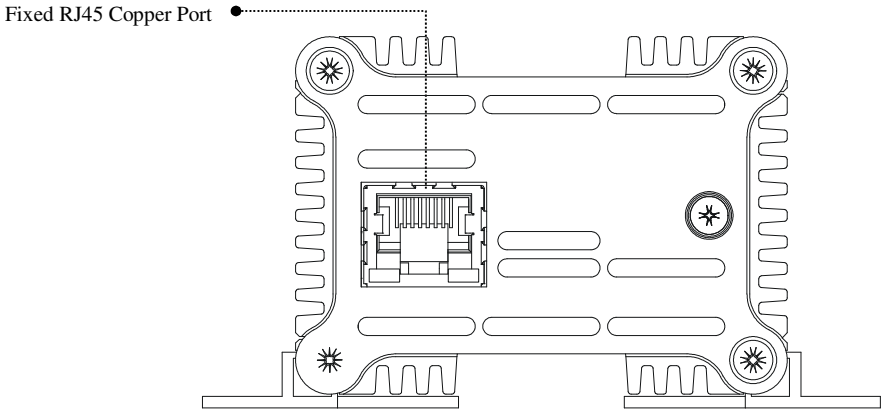
1022054P05

1.4 OSD2054P FRONT AND REAR PANELS

There are two fixed 10/100Mbps RJ45 copper ports: the PoE located on the front panel and non-PoE on the rear panel. The SFP port and 2-way term-block power connector are also located on the front panel. The SFP device is sold separately giving the user choice to use either one or two fiber communications with various optical power outputs depending on the distance and link budget required.



OSD2054P Front Panel



OSD2054P Rear Panel

FIGURE 2: OSD2054P CONNECTORS

2 INSTALLATION AND OPERATION

2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD2054P 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 60825-1:2014 standard.

Class 1
The OSD2054P is a **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.

2.2.2 OSD2054P DRAWINGS AND DIMENSIONS

The standard OSD2054P is designed to be mounted on an even surface and to be secured by means of M4 or smaller screws. All dimensions are in mm. The unit also can be mounted on a standard DIN rail with the OSD2054P DIN Rail bracket.

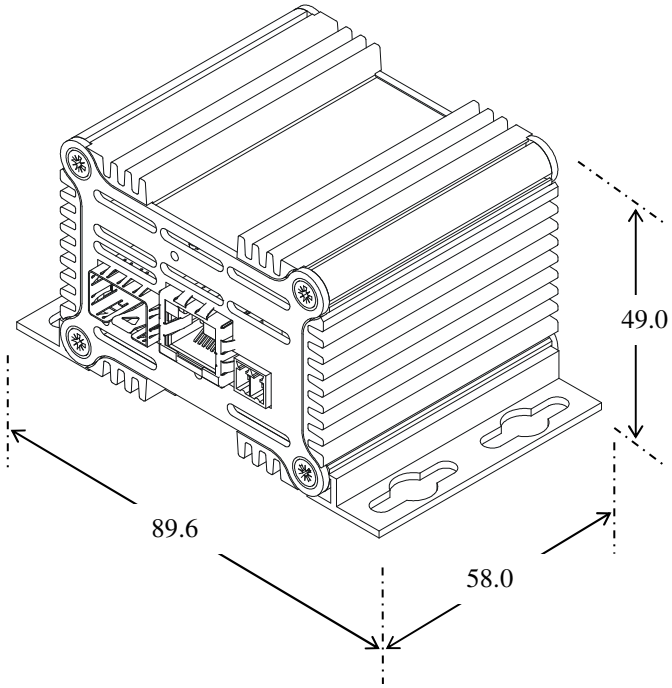


FIGURE 3: OSD2054P DIMENSIONS

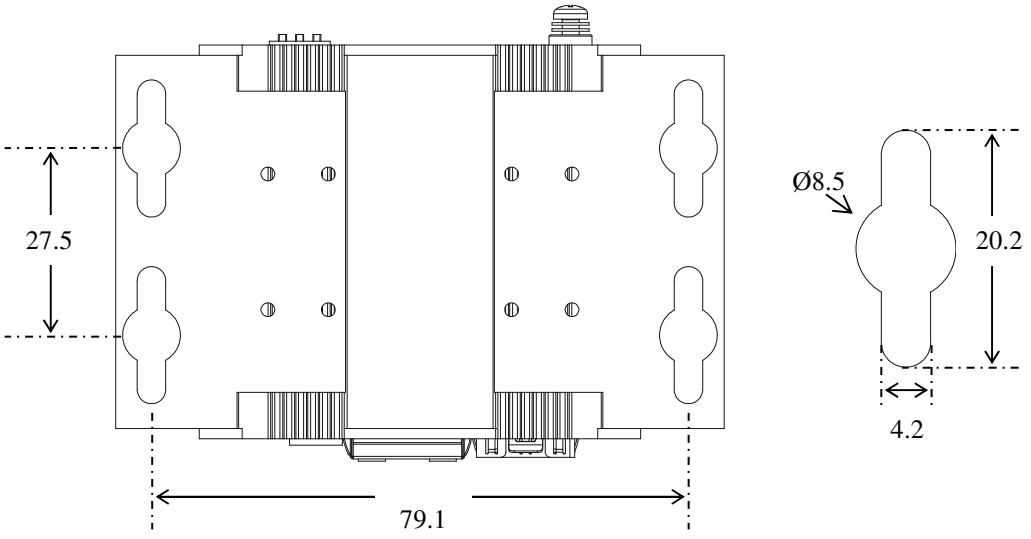


FIGURE 4: OSD2054P MOUNTING DIMENSIONS

2.2.3 POWER SUPPLY CONNECTIONS

The OSD2054P requires external DC power. The voltage range of the OSD2054P is $+10V_{DC}$ to $+36V_{DC}$ and for the OSD2054P/48V_{DC} is $+47V_{DC}$ to $+57V_{DC}$. Power should be connected to the 2-way terminal block located on the front panel as indicated in Table 2.

TABLE 2: POWER CONNECTION

External Power Pin	OSD2054P	OSD2054P/48VDC
+	$+10V_{DC}$ to $+36V_{DC}$	$+47V_{DC}$ to $+57V_{DC}$
-	0V	0V

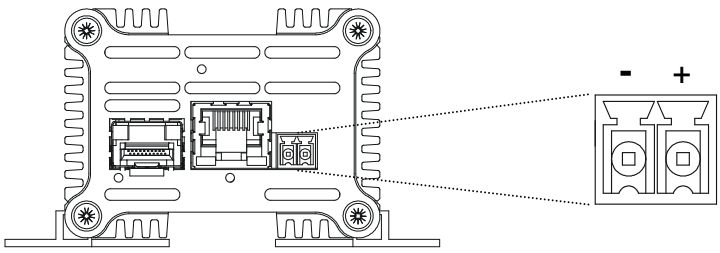
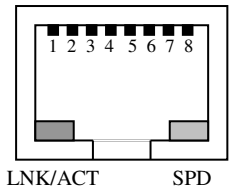


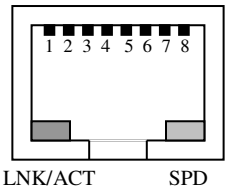
FIGURE 5: MODULE POWER SUPPLY CONNECTIONS

2.2.4 FIXED RJ45 COPPER PORT PIN ASSIGNMENTS

There are two RJ45 Ethernet copper ports on the OSD2054P; PoE is available on one port (Front Panel). Both ports support IEEE802.3af Ethernet. Figure 6 shows the pin configuration for the fixed RJ45 copper ports.



Fixed PoE Port
Front Panel



Fixed Copper Port
Rear Panel

Pin	10Base-T	100Base-T	PoE
1	TX+	TX+	TX+
2	TX-	TX-	TX-
3	RX+	RX+	RX+
4	n/c	n/c	VDC+
5	n/c	n/c	VDC+
6	RX-	RX-	RX-
7	n/c	n/c	VDC-
8	n/c	n/c	VDC-

Tx: Transmit
Rx: Receive
n/c: Not Connected

FIGURE 6: FIXED RJ45 ETHERNET CONNECTORS

2.2.5 LED INDICATORS

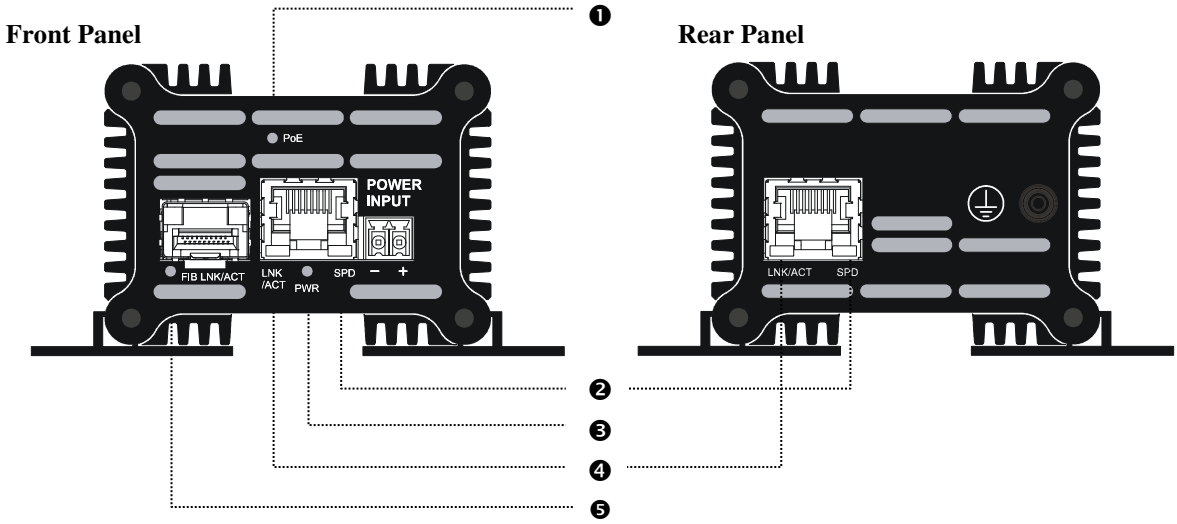


FIGURE 7: LED INDICATORS

TABLE 3: LED FUNCTION

No	FUNCTION				
	Indicator	**On**	**LED Colour**	**Off**	**Blinking**
❶	PoE	PoE Active	Green	No PoE	-
❷	SPD	Copper Speed: 10/100Mbps	Green	N/A	-
❸	PWR	Power On	Green	Power Off	-
❹	LNK/ACT	Copper Link Activity	Yellow	No Copper Link	Activity(1)
❺	LNK SPD	Fiber Link Speed	Green	No Optical Link	Activity(1)

Note: (1) Activity indicates traffic for both copper and fiber port.

2.2.6 FITTING SFP CONNECTORS

Care should be taken when inserting/removing the SFP connectors from the 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 appropriate fiber cable.

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

Fiber SFP

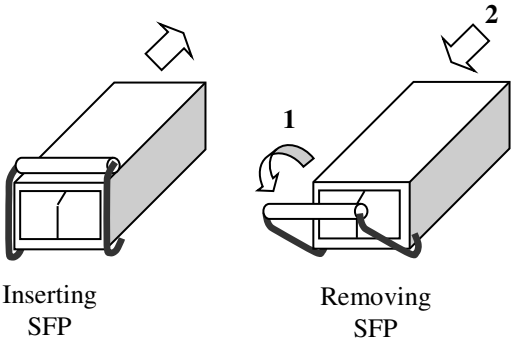


FIGURE 8: FITTING/REMOVING SFP CONNECTORS

2.2.7 BASIC CONNECTIONS

Figure 9 shows basic user connections to the OSD2054P.

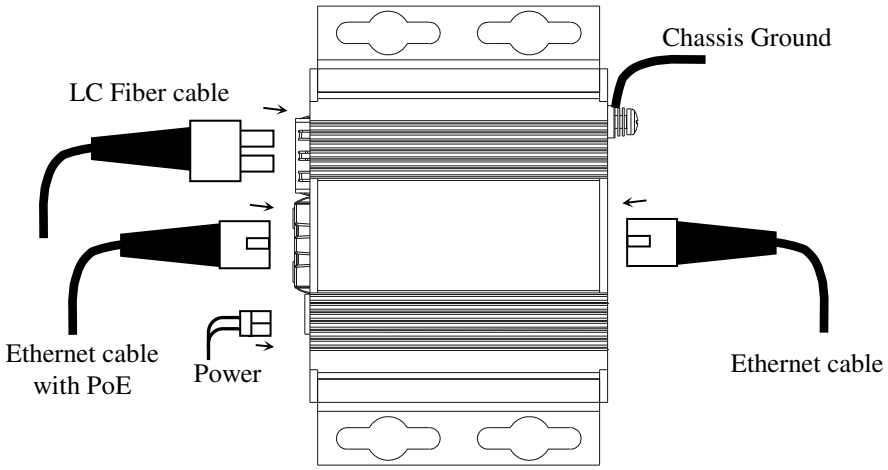


FIGURE 9: BASIC CONNECTIONS

3 MAINTENANCE

3.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD2054P 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.
- Inspect the SFP optical connectors 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 OSD2054P.

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, NSW, Australia 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.

Optical Systems Design Pty. Ltd.
7/1 Vuko Pl. Warriewood 2102
P.O. Box 891 Mona Vale
N.S.W. Australia 2103
Telephone: +61 2 9913 8540
Facsimile: +61 2 9913 8735
Email: sales@osd.com.au
Web Site: www.osd.com.au

OPTICAL
SYSTEMS
DESIGN
PTY LTD A.B.N. 83 003 020 504

Printed in Australia