
OPTICAL

SYSTEMS

DESIGN

OPERATOR MANUAL

OSD8220 SERIES

3G HD/SDI TX/RX

FIBER OPTIC TRANSMISSION SYSTEM

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1 TECHNICAL SUMMARY

1.1 BRIEF DESCRIPTION

1.1.1 OVERVIEW

The OSD8220 series is a compact high-quality fiber optic 3G serial digital video (SDI) transmission system. The system consists of the OSD8220T transmitter and the OSD8220R receiver, which are designed to be used as a pair, and provide one-way transmission of video. The system incorporates the use of V-SFPs and is available in 1310nm, 1550nm and all eighteen CWDM wavelengths. The OSD8220 pair is suitable for point to point applications or can be used to optically distribute 3G HD/SDI to a number of receivers.

The OSD8220T accepts one 3G HD/SDI video input signal where the serial digital video signal is equalized and reclocked to the SMPTE standards. The OSD8220T has an automatic equaliser for Belden 1694A cable. This allows flexibility for permanent and temporary installations when the SDI source is some distance away from the unit. The user can disable the equaliser with a toggle switch mounted on the front panel.

The OSD8220R provides adjustment free operation over the full optical range of the unit. The OSD8220R also has the extremely useful feature of having basic built-in optical power meter: this allows the user to quickly identify any problem with the optical link.

Both the OSD8220T and OSD8220R have built-in user bypassable automatic reclocking. The units will lock at 270Mbps, 1.485Gbps and 2.97Gbps. The user can disable the reclocker with a toggle switch mounted on the front panel.

The OSD8220 is available as a small elliptical case and require an external power source of +5 to +20V_{DC}.

1.1.2 APPLICATIONS

- ▲ Any digital broadcast application such as studio signal routing and temporary OB or studio links
- ▲ Remote camera links
- ▲ Campus digital video distribution
- ▲ Very high performance surveillance networks

1.1.3 FEATURES AND BENEFITS

- ▲ Available with built in user bypassable automatic reclocking at 270Mbps, 1.485Gbps and 2.97Gbps
- ▲ Operates from 19.4Mbps to 2.97Gbps in non-reclocked mode
- ▲ Compatible with SMPTE 310M, 292M, 259M, 297M, 372M and 424M
- ▲ Automatic equalisation of up to 350m @ 270Mbps and 70m @ 2.97Gbps of Belden 1694A cable
- ▲ Built-in optical power meter on the OSD8220R
- ▲ Available in 1310nm, 1550nm and all 18 CWDM wavelengths
- ▲ Capable of operation to over more than 50km
- ▲ Immune to pathological signals
- ▲ Extremely small and rugged unit is suitable for both permanent and temporary throwdown applications
- ▲ Uses Video SFP for optical communication (VSFP sold separately)

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1.2 TYPICAL CONFIGURATION

Figure 1 below indicates the typical set-up for an OSD8220 system.

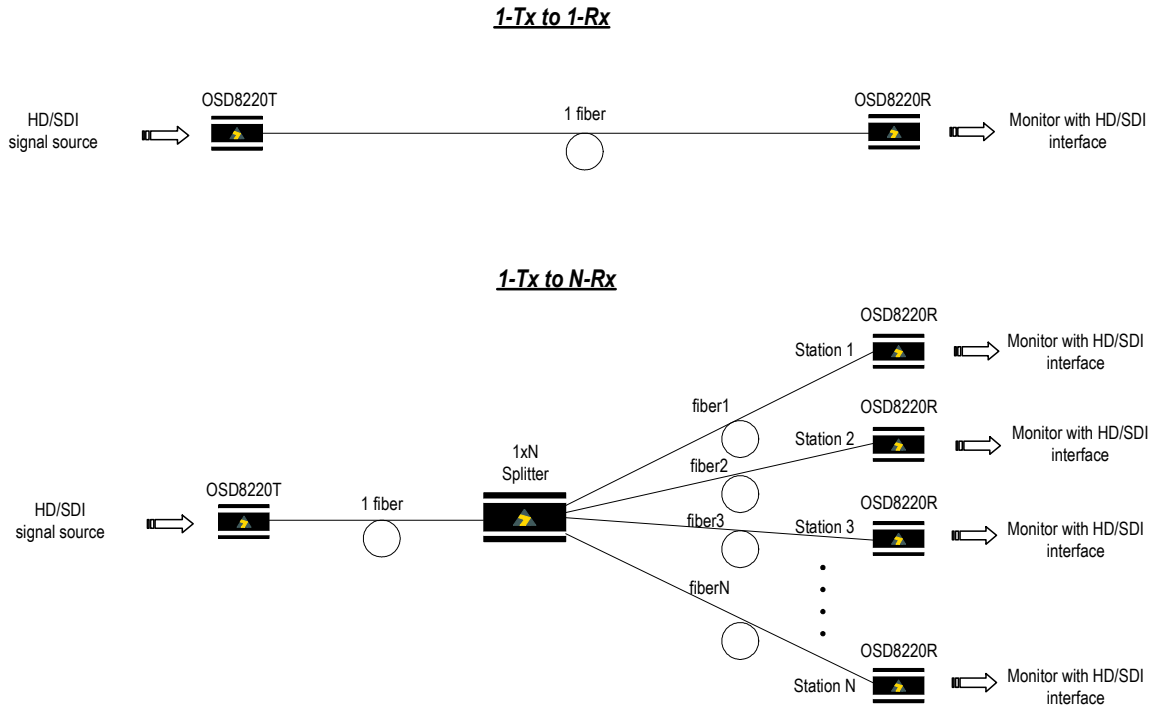


FIGURE 1: OSD8220 TYPICAL CONFIGURATIONS

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1.3 TECHNICAL SPECIFICATIONS

Table 1 below provides Technical Specifications for the OSD8220.

TABLE 1: TECHNICAL SPECIFICATIONS

SPECIFICATION	PERFORMANCE
Input/Output Impedance	75Ω
Input/Output Levels	800mVpp nominal
Coax Equalization	350m @ 270Mbps 140m @ 1.485Gbps 70m @ 2.97Gbps
SDI Connector	BNC Female Socket
Power Connector	2-pin Terminal Block
Optical Interface	SMPTE 297-2006
Optical Port Connector	VSFP (Single fiber LC connector as standard)
Video SFP Options	OSDSFP3GT1/30km – 3G HD/SDI SFP Plug-in Transmitter up to 30km (plugs into OSD8820T) OSDSFP3GR1 – 3G HD/SDI SFP Plug-in Receiver (plugs into OSD8220R)
Transmitter Wavelength	1310nm ±30nm (1550nm and CWDM wavelengths are optionally available)
Transmitter Coupled Power	-5 to -0dBm into singlemode fiber (see VSFP datasheet for options)
Receiver Sensitivity	<-18dBm
Receiver Saturation	>0dBm
Standard SM Optical Link Budget	>13dB: >30km of singlemode fiber @ 1310nm
Power Requirements	+5 to 20V _{DC} @ 2VA
Enclosure	Strong metal case
Dimensions (mm)	40W x 25H x 55L
Weight	50g
Operating Temperature	-20°C to +65°C
Relative Humidity	0 to 95% non-condensing

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NOTES:

1. Special configurations to cover longer distances also available. Contact OSD for a full listing of available options.
2. Special care must also be taken to use the correct Video SFP (VSFP); using an Ethernet SFP in this product will not work and may cause damage to the port.

2 INSTALLATION AND OPERATION

2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD8220T and OSD8220R 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 CABLING

Shielded cables should be used on all cabling to provide protection from external electrical events such as lightning, and switching transients etc. which may cause damage to the unit. All cable shielding must be grounded at a convenient ground point.

2.2.2 WARNING AND PRECAUTIONS

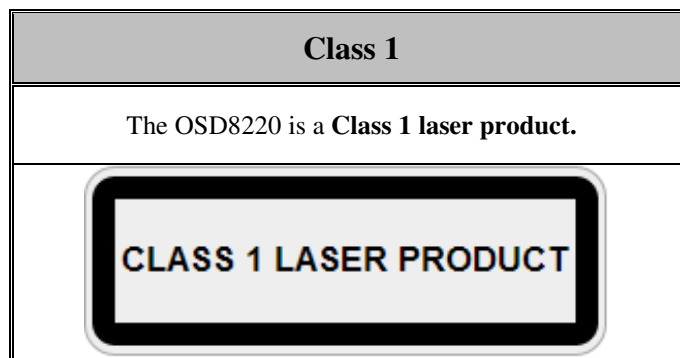
V-SFP – WARNING. The OSD8220 uses OSD V-SFP *ONLY*. Do not insert any other SFP into port as permanent damage will occur to product and void warranty

▲ 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 60825-1:20011 standard.



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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2.2.3 OSD8220 DRAWINGS AND DIMENSIONS

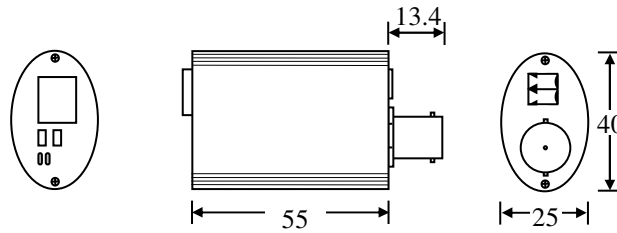


FIGURE 2: OSD8220 MOUNTING DIMENSIONS

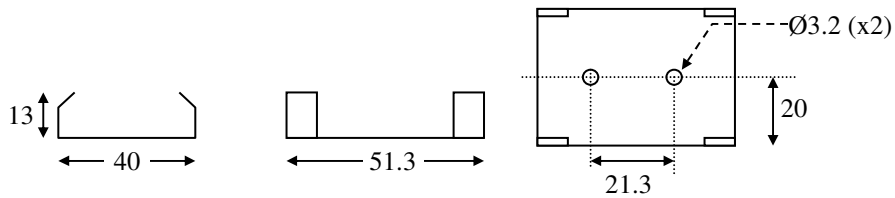


FIGURE 3: OSD8220 MOUNTING CLIP DIMENSIONS

2.2.4 POWER SUPPLY CONNECTIONS

The OSD8220T and OSD8220R requires external DC power. The voltage range is +5V_{DC} to +20V_{DC} @2VA. Power should be connected to the power socket located on the side of the units. DC power should be connected as indicated below;

TABLE 2: OSD8220 DC POWER CONNECTION

External Power Pin	Specification
Pin 1	Ground or 0V
Pin 2	+5V to 20V DC

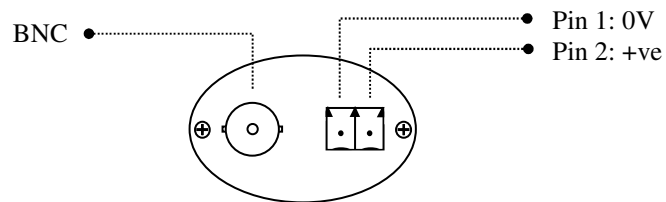


FIGURE 4: OSD8220 POWER SUPPLY CONNECTIONS

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2.2.5 FITTING OSD V-SFP CONNECTORS

Care should be taken when inserting/removing the OSD V-SFP connectors from V-SFP port as V-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.

WARNING

The OSD8220 uses OSD V-SFP *ONLY*. Do not insert any other SFP into port as permanent damage may occur to product and void warranty.

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

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

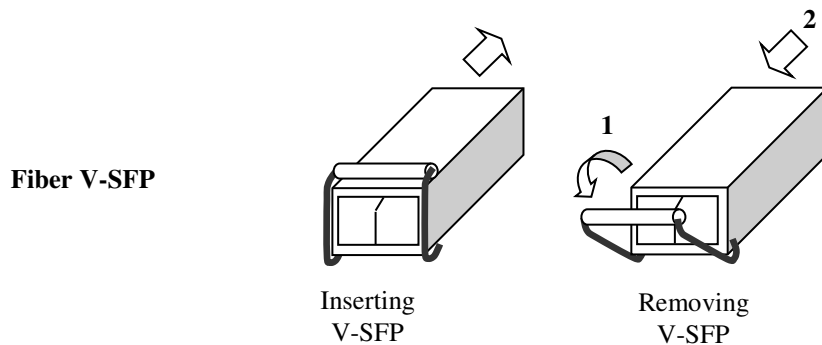


FIGURE 5: FITTING/REMOVING V-SFP CONNECTORS

Ensure that the correct VSFP is fitted to the OSD8220T and OSD8220R. (Eg. OSDSFP3GT1/30km in OSD8220T and OSDSFP3GR1 into OSD8220R)

2.2.6 OTHER CONNECTIONS

The 3G HD/SDI video-input signal (eg. from camera) is connected to the video input BNC connector on the OSD8220T. The video output signal (eg. to monitor equipment) is connected from the video output BNC connector on the OSD8220R.

The optical fiber cable must be terminated with the appropriate optical connector. Before connection, inspect the ends of the connectors to ensure that no dust or dirt is present as it could contaminate the modem connector and result in poor performance. If it is necessary to clean the cable connectors, use isopropyl alcohol and lint free tissue to remove contamination.

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2.3 OSD8220 OPERATION

2.3.1 SWITCH SETTINGS

The OSD8220T has an Automatic Equalizer and Reclocker switch located on the front panel. The OSD8220R has only the Reclocker switch. The default setting upon shipment is in the “on” position.

TABLE 3: OSD8220T SWITCH SETTINGS

OSD8220T

SWITCH	STATE	POSITION	FUNCTION	DEFAULT
RCLK	OFF	LEFT	Reclocker Bypassed	
	ON	RIGHT	Reclocker Enabled	default*
EQ	OFF	RIGHT	Automatic Equalizer Off	
	ON	LEFT	Automatic Equalizer On	default*

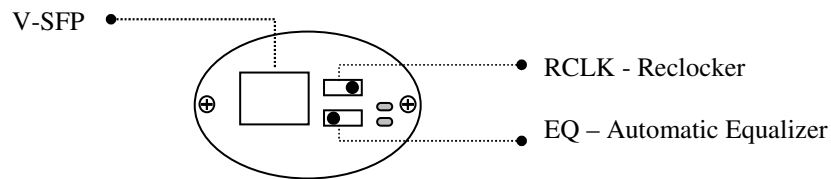


FIGURE 6: OSD8220T SWITCH SETTINGS

TABLE 4: OSD8220R SWITCH SETTINGS

OSD8220R

SWITCH	STATE	POSITION	FUNCTION	DEFAULT
RCLK	OFF	LEFT	Reclocker Bypassed	
	ON	RIGHT	Reclocker Enabled	default*

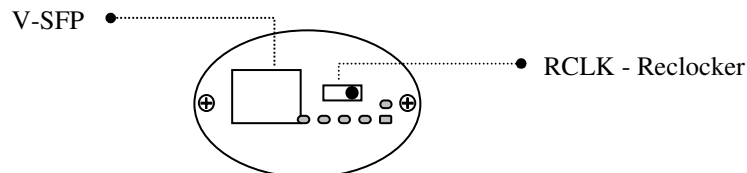


FIGURE 7: OSD8220R SWITCH SETTINGS

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2.3.2 OSD8220T AND OSD8220R INDICATORS

OSD8220T

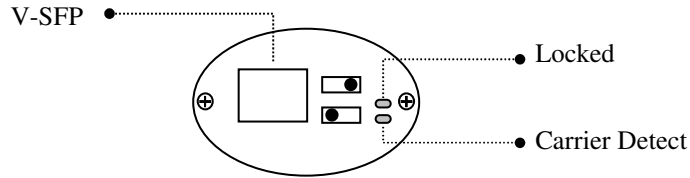


FIGURE 8: OSD8220T LED INDICATORS

TABLE 5: OSD8220T INDICATOR FUNCTION

INDICATOR	COLOUR	FUNCTION
Locked	Off	Reclocker not locked or reclocker in bypass mode
	Green	Reclocker is locked
Carrier Detect	Off	Carrier detected
	Red	SDI source is unplugged

OSD8220R

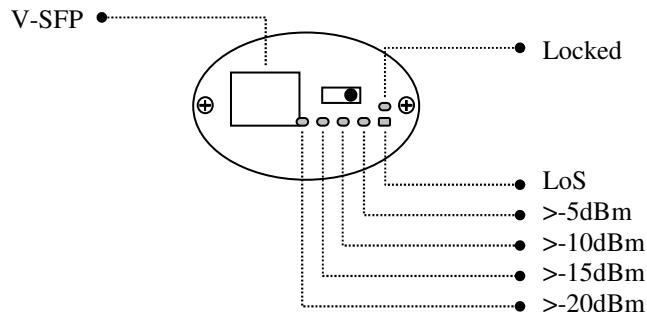


FIGURE 9: OSD8220R LED INDICATORS

TABLE 6: OSD8220R INDICATOR FUNCTION

INDICATOR	COLOUR	FUNCTION
Locked	Off	Reclocker not locked or reclocker in bypass mode.
	Green	Reclocker is locked
LoS	Red	No Optical Signal Detected
	Off	Signal Detected
-5dBm	Green	Optical Power above -5dBm
-10dBm	Green	Optical Power above -10dBm
-15dBm	Green	Optical Power above -15dBm
-20dBm	Green	Optical Power above -20dBm

3 MAINTENANCE

3.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD8220T and OSD8220R 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 HD/SDI signals are connected to the modem correctly and that the distant OSD8220T or OSD8220R modem has been terminated correctly to any external equipment.
- ▲ Inspect the optical connectors for any contamination and clean using isopropyl alcohol and a lint free tissue if any contamination is detected.
- ▲ Check that any external termination resistors are connected if the system configuration requires them.

3.3 ROUTINE MAINTENANCE

- ▲ There is no routine maintenance required with the OSD8220T and OSD8220R.

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 labels is evident.

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