OPTIC▲L
SYSTEMS
DESIGN

OPERATOR MANUAL

OSD8815 SERIES

DIGITAL VIDEO

FIBER OPTIC TRANSMISSION SYSTEM

INDEX 1

1 TECHNICAL SUMMARY

1.1 BRIEF DESCRIPTION

1.1.1 OVERVIEW

The OSD8815 series is a high-quality fiber optic digital video and data transmission system. The system consists of the OSD8815T and the OSD8815R, which are designed to be used as a pair, and provide one-way transmission of PAL, NTSC or SECAM video.

The OSD8815T accepts one analog composite video input signal that is converted to digital with 10-bit resolution so as to preserve the quality of the input signals. The resulting digital signal is multiplexed and transmitted as a digital bit-stream through the fiber. The OSD8815T provides adjustment free operation over the full optical range of the unit.

The OSD8815R incorporates a high performance optical digital receiver for incoming video signal. The unit provides a constant video output level which is independent of link loss.

The OSD8815T and OSD8815R are available in two physical configurations: card or module. The card versions is designed to fit the 3RU-high 19" OSD370 or OSD350 chassis, which allows multiple OSD card products to be conveniently powered from and located in the one chassis. The module case version is intended for isolated use and requires an external power source.

The OSD8815 system can be used with any standard multimode optical fiber, and is available optionally for singlemode fiber use over a single fiber for transmission and reception.

1.1.2 APPLICATIONS

▲ Very high performance surveillance systems where high resolution or long transmission distances are required

▲ Safe city CCTV system video transmission

▲ Transportation communication systems

1.1.3 FEATURES AND BENEFITS

▲ Bandwidth of 10MHz.

▲ Operating range of at least 3km on multimode fiber, 30km on singlemode fiber with greater than 100km possible with optional optical devices

▲ Performance is maintained at the same high quality over all link lengths

▲ Adjustment-free receiver operation

▲ Small size, low cost, robust and reliable

▲ Broadcast quality 10 bit video

▲ Two audio channels are optionally available

▲ Available as a small standalone module or as a card which plugs into the OSD350 or OSD370 chassis

1.2 TYPICAL CONFIGURATION

Figure 1 below indicates the typical set-up for an OSD8815 system.
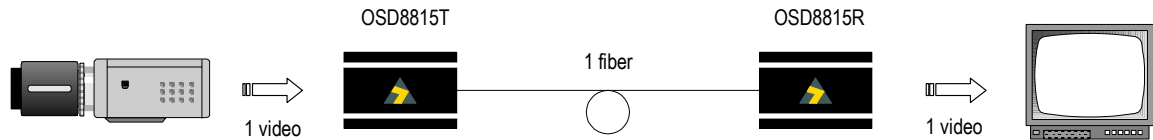
FIGURE 1: OSD8815 TYPICAL CONFIGURATION

1.3 PRODUCTS AND OPTIONS

There are various options available for the OSD8815 as identified in Table 1 below:

OSD8815 | T | | L | | C | (example only)

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TABLE 1: PRODUCTS AND OPTIONS

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ITEM	DESCRIPTION
T	Transmitter
R	Receiver

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ITEM	DESCRIPTION
-	Multimode operation
L	Singlemode operation
A	2 Channel Audio Version

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ITEM	DESCRIPTION
-	Card version (3RU high chassis mount for OSD370 or OSD350)
C	Stand-alone module version
OSD8815PP	OSD8815 Power Pack, 90 to 264VAC/12VDC

1.4   TECHNICAL SPECIFICATIONS

Table 2 below provides Technical Specifications for the OSD8815.

TABLE 2: TECHNICAL SPECIFICATIONS

SPECIFICATION	PERFORMANCE
Electrical	
Video Input/Output Impedance	75Ω composite
Video Input/Output Levels	1Vpp nominal
Video Connectors	BNC
Video Bandwidth	5Hz to 10MHz (±1dB)
Weighted Video Signal to Noise Ratio	> 65dB at all receive levels over full dynamic range
Weighted Video SNR with Audio Option	> 63dB at all receive levels over full dynamic range
Differential Gain	< 0.7%
Differential Phase	< 0.7°
Audio	
Number of Channels	2
Audio Bandwidth	10Hz to 20kHz +1, -3dB
Audio Input/Output Impedance	>10kΩ/<200Ω
Audio Input Level	250mVrms
Audio Output Level	250mVrms nominal
Audio Headroom	15dB
Audio Weighted SNR	>90dB at maximum level
Audio Distortion	<0.05%
Audio Connector	3.5mm stereo socket
Optical	
Transmitter Wavelength	1310nm
OSD8815T Transmitter Coupled Power	-11 to -4dBm into multimode fiber -13 to -8dBm into singlemode fiber
OSD8815R Receiver Sensitivity	<-28dBm
OSD8815R Receiver Saturation	>-3dBm
Link Distances	> 3km multimode (fiber bandwidth limited) > 30km singlemode (fiber loss limited)
Optical Connectors	ST standard, others optional
Physical	
Dimensions (mm)	60W x 94D x 26H (module - excluding flange and connectors) 25W x 208D x 100H (card)
Weight	0.2kg (module), 0.2kg (card)
Power Requirements	+9V to +35V$_{DC}$, 22 to 28V$_{AC}$ @ 3VA
Power connector	2-Pin power socket
Operating Temperature	-20°C to +75°C
Relative Humidity	0 to 95% non-condensing

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NOTES: Other combinations of laser types and optical levels, receiver types and sensitivity levels are possible. Contact OSD for details.

2   INSTALLATION AND OPERATION

2.1   INTRODUCTION

This section outlines the methods required to install and operate the OSD8815T and OSD8815R 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 60825-1:20011 standard.

| Class 1 |
| :---: |
| The OSD8815 is a **Class 1 laser product.** |
| CLASS 1 LASER PRODUCT |
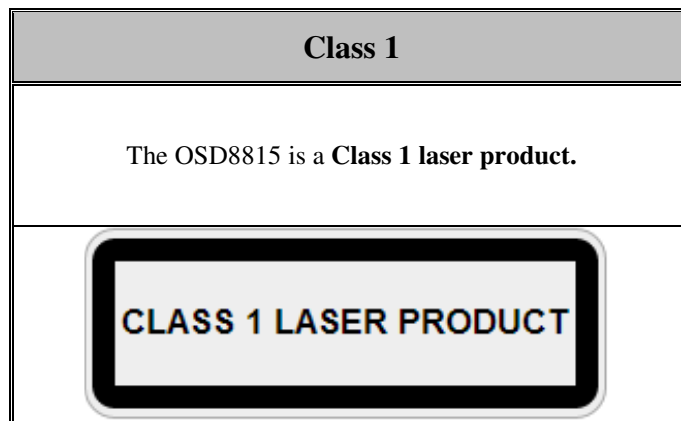
PRECAUTIONS

▲ 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.

2.2.2   OSD8815 DRAWINGS AND DIMENSIONS

The OSD8815TC and OSD8815RC are designed to be mounted on an even surface and to be secured by means of M4 or smaller screws. The OSD8815T and OSD8815R card versions are designed to be inserted into a chassis and secured by means of captivated screws.
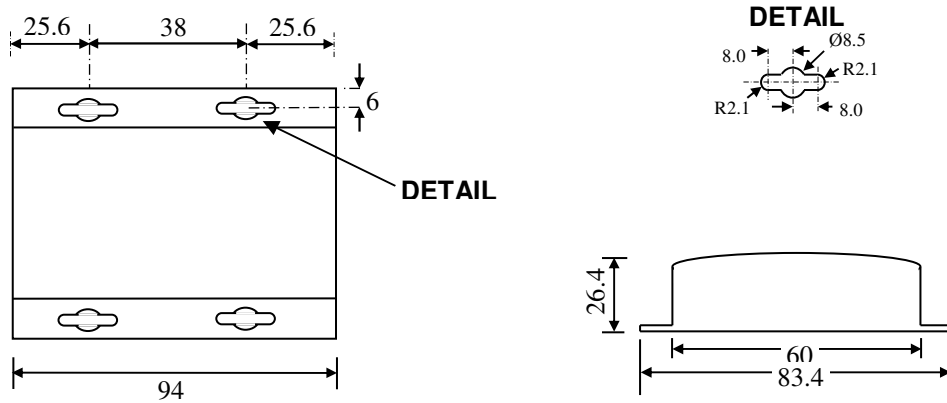
(a)   Module Version
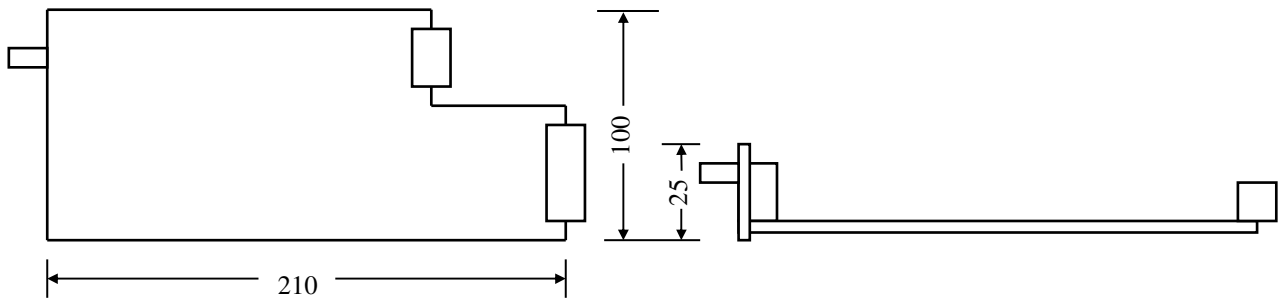
(b)   Card Version

FIGURE 2: OSD8815 MOUNTING DIMENSIONS

2.2.3   POWER SUPPLY CONNECTIONS

The OSD8815 card version is powered from the OSD370 or OSD350 chassis. DC power to the OSD8815 card version is connected via a DB9 connector. The card version of the OSD8815T and OSD8815R should be fixed into the OSD370 (or OSD350) chassis using the captivated screws. Either card can be plugged in or out of the OSD370 (or OSD350) chassis with power on or off.

The OSD8815 module requires external DC or AC power. The voltage range of the OSD8815 is +9V to +35V_{DC} or 22V to 28V_{AC} @ 3VA. Power should be connected to the power socket located at the back of the case and should be connected as indicated in Table 3.

TABLE 3: DC OR AC POWER CONNECTION

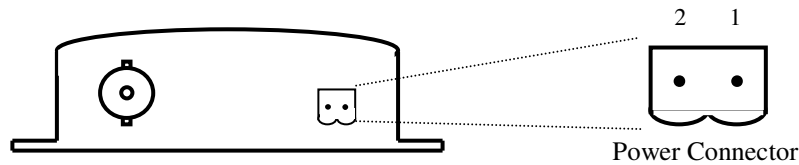| External Power Pin	Specification
Pin 1	+9V to +35V_{DC} or 22V to 28V_{AC} @ 3VA
Pin 2	0V

Power Connector

FIGURE 3: OSD8815C POWER SUPPLY CONNECTIONS

2.2.4   OTHER CONNECTIONS

The video-input signal (eg. from camera) is connected to the video input BNC connector on the OSD8815T. The video output signal (eg. to monitor) is connected from the video output BNC connector on the OSD8815R.

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.

2.3   OSD8815 OPERATION

2.3.1   OSD8815T AND OSD8815R OPERATION

When using the OSD8815 for the first time, check that the unit is in good condition with no visible damage.

If a card version is used, insert it in an appropriate slot on the OSD370 or OSD350 chassis and check that the indicators illuminate accordingly on power up (see Table 4 and Table 5). If a module version (OSD8815C) is used, connect the unit to an appropriate power source and check that the indicators illuminate accordingly on power up (see Table 4 and Table 5).

To connect a video signal, connect a BNC terminated coaxial cable from the camera to the OSD8815T. If the camera is operational, the "Video Present" indicator should illuminate 'Amber'.

Connect a BNC terminated coaxial cable between the BNC socket on the rear of the OSD8815R and the video monitor or switcher.

Plug in the optical connectors of the optical cable. If the set-up is connected correctly, the OSD8815R "Receive Signal OK" LED will change from 'Red' to 'Green'. If a video signal is being received the "Video Present" indicator on the OSD8815R should be 'Amber'; if no video signal is being received this indicator will not be illuminated.
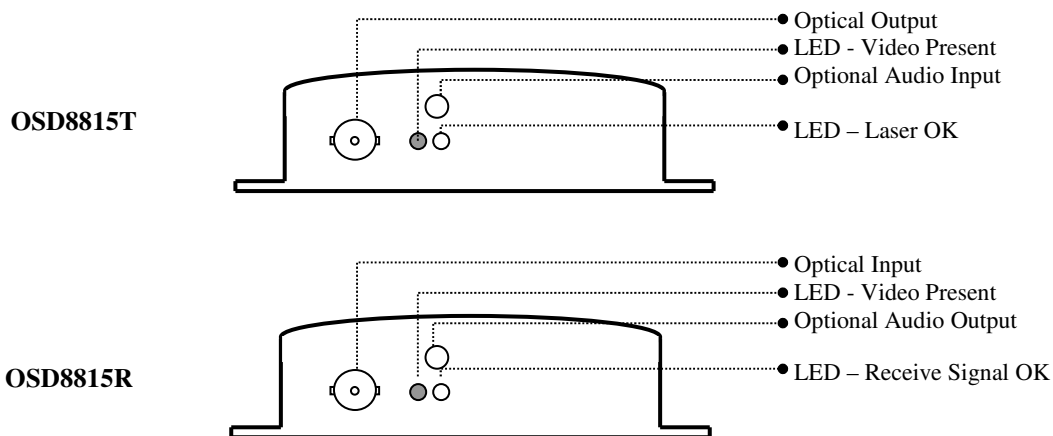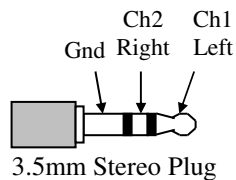
FIGURE 4: OSD8815TC AND OSD8815RC FRONT SIDE VIEW

FIGURE 5: OPTIONAL AUDIO JACK CONNECTIONS

2.3.2   OSD8815T AND OSD8815R INDICATORS

TABLE 4: OSD8815T INDICATOR FUNCTION

INDICATOR	PARAMETER	LED COLOUR	FUNCTION
VIDEO PRESENT	Video Input Status	Off	No video signal present
		Amber	Video signal present
LASER OK	Output Laser Status	Red	Laser faulty
		Green	Laser OK

TABLE 5: OSD8815R INDICATOR FUNCTION

INDICATOR	PARAMETER	LED COLOUR	FUNCTION
VIDEO PRESENT	Video Input Status	Off	No video signal present
		Amber	Video signal present
RECEIVE SIGNAL OK	Link Status	Red	No optical signal received
		Green	Optical Signal received

NOTE:

"Receive Signal OK " Indicator refers to the received data stream. LED is 'green' after the optical link is established and the receiver is locked onto the incoming data stream and detects a low Bit Error Rate. LED will indicate 'red' after the Bit Error Rate reaches an unacceptable level or when there is no optical link established.

3   MAINTENANCE

3.1   INTRODUCTION

The following section outlines the fault-finding procedure for the OSD8815T and OSD8815R 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 video signals are connected to the modem correctly and that the distant OSD8815T or OSD8815R 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 OSD8815T and OSD8815R.

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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