OPTICAL
SYSTEMS
DESIGN

OPERATOR MANUAL

OSD725/16

16 CHANNEL AUDIO

FIBER OPTIC TRANSMISSION SYSTEM

INDEX 1

1 TECHNICAL SUMMARY

1.1 BRIEF DESCRIPTION

1.1.1 OVERVIEW

The OSD725/16 audio transmission system is a high performance 16 channel digital audio multiplexer employing 18 bit A/D and D/A conversion. It is intended for use in such hostile environments as industrial sites and concert venues and as such is designed and built very conservatively with well derated components and very robust construction.

It operates at standard broadcast levels and with selectable impedance levels for optimum flexibility. The units are completely self contained and require no user adjustments for operation over up to 4km of multimode fibre and 40km of singlemode fibre.

The OSD725/16 comes in a 2RU high 19” rack mounting enclosure. A 32 channel version, the OSD725/32, is also available and is packaged in a 3RU high 19” rack mounting enclosure.

1.1.2 APPLICATIONS

- Public address systems
- Links requiring transfer of high quality audio.
- Long or short distance multi channel audio distribution.
- Studio audio distribution
- Sound stage to console connection
- Campus audio program distribution

1.1.3 FEATURES AND BENEFITS

- Link diagnostic indicators provided.
- More secure than copper cables.
- No user adjustments required.
- Broadcast quality 18 bit digital transmission
- Supports 16 audio channels
- Extremely rugged 2U high 19" rack mounting chassis

1.2 TYPICAL CONFIGURATION

Figure 1 shows a typical OSD725/16 set-up to transmit 16 audio channels.

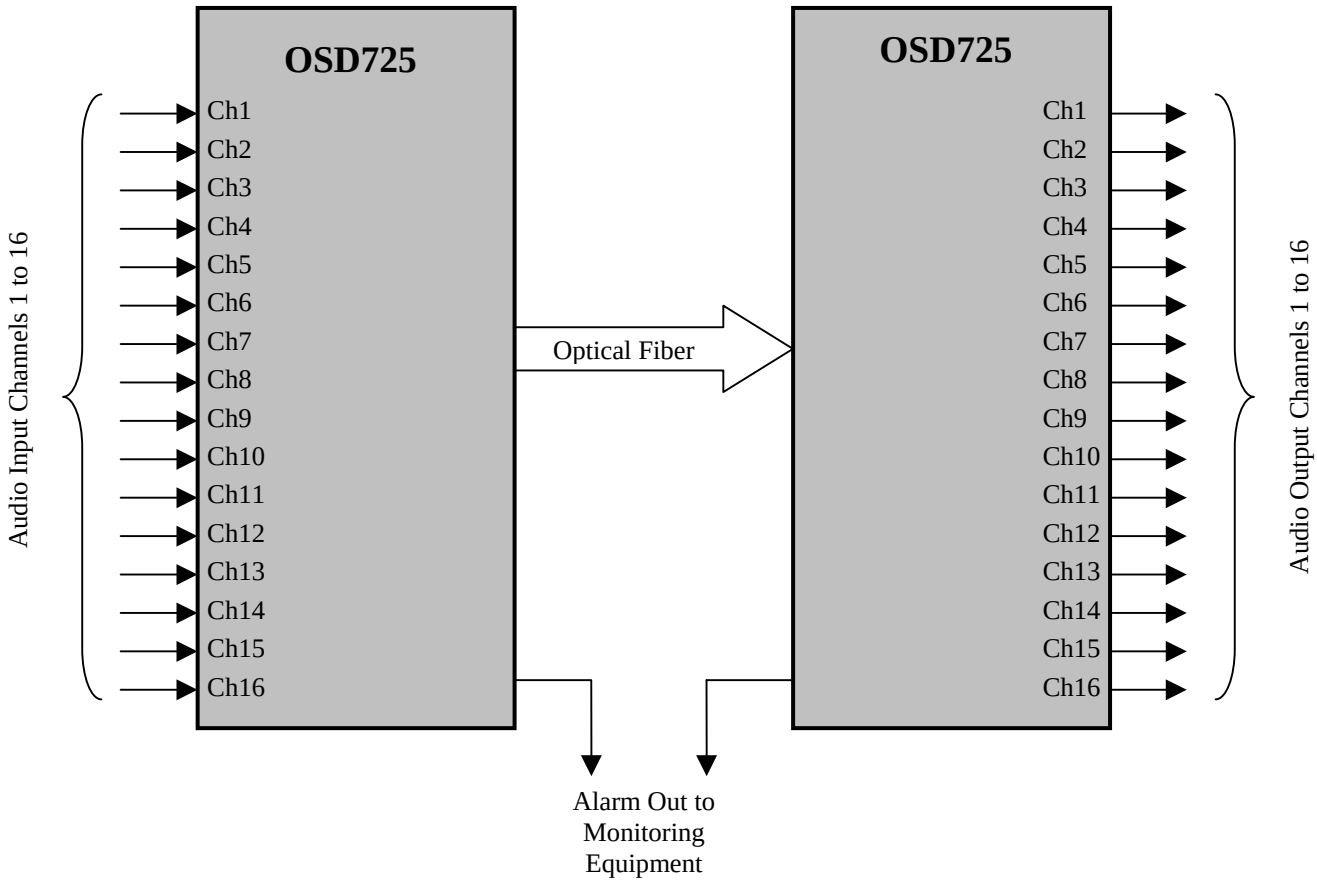


FIGURE 1: OSD725/16 TYPICAL CONFIGURATION

1.3 TECHNICAL SPECIFICATIONS

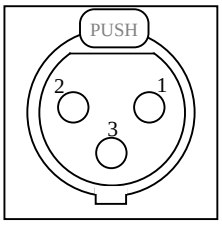
TABLE 1: OSD725T/OSD725R SPECIFICATIONS

SPECIFICATION	PERFORMANCE
Nominal Level	0dBu (775mV$_{rms}$)
Headroom	20dB
Input Impedance	600Ω or 10kΩ (user selectable)
Output Impedance	40Ω
Audio Connectors	XLR, female on OSD725T transmitter, male on OSD725R receiver
Format	Balanced input and output
Signal to Noise Ratio	>70dB at nominal level
Total Harmonic Distortion	<0.05% at nominal level
Bandwidth (-3dB)	10Hz to 20kHz (±0.5dB)
Optical Wavelength	850nm (OSD725T) 1300nm (OSD725TL)
Transmit Power	-13 to -10dBm into multimode fibre (OSD725T only) -13 to -10dBm into singlemode or multimode fibre (OSD725TL only) -7 to -3dBm into single mode or multimode fibre (OSD725T/13-7 only)
Receiver Sensitivity	<-33dBm
Receiver Saturation	>-10dBm
Link Budget and Transmission Distance	>20dB: >6km for multimode > 50km for singlemode
Optical Connectors	ST Standard, SC and FC optional
Power Supply Range	95 to 265V$_{AC}$ @ 10VA
Power Connector	IEC Socket
Dimensions (mm)	483W x 216D x 88H
Weight	6kg
Operating Temperature	-20 to 60°C
Relative Humidity	0 to 95% non-condensing

10272504

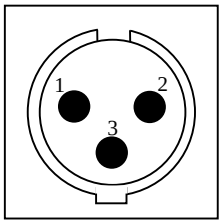
1.4 PIN ASSIGNMENTS

Pin assignments for the audio input/output XLR Male and Female connectors are shown below.



OSD725T Female XLR

Pin	Connection
1	Ground
2	+ Input
3	- Input

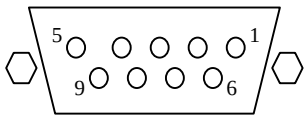


OSD725R Male XLR

Pin	Connection
1	Ground
2	+ Input
3	- Input

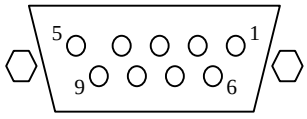
FIGURE 2: XLR MALE/FEMALE CONNECTOR AND PIN ASSIGNMENT

Pin assignments for the Alarms DB9 connector is shown below.



OSD725T DB9

Parameter	Status	Connection
	Off	Pin 5 to Pin 4
	On	Pin 5 to Pin 9
	Faulty	Pin 2 to Pin 1
	OK	Pin 2 to Pin 6



OSD725R DB9

Parameter	Status	Connection
	Off	Pin 5 to Pin 4
	On	Pin 5 to Pin 9
	Poor	Pin 8 to Pin 1
	OK	Pin 8 to Pin 6
	Alarm	Pin 2 to Pin 7
	OK	Pin 2 to Pin 3

FIGURE 3: DB9 ALARMS CONNECTOR AND PIN ASSIGNMENT

2 INSTALLATION AND OPERATION

2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD725T and OSD725R 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 lighting, 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

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

Class 1	Class 3A
The multimode version of the OSD725 is a **Class 1 LED product**. Wavelength of 850nm and <-8dBm power output.	The singlemode versions of the OSD725 are **Class 3A laser products.** Wavelength of 1310nm and <+5dBm power output or wavelength of 1550nm and <+7dBm power output.
	

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.

2.2.3 OSD725 DRAWINGS AND DIMENSIONS

The OSD725 unit is designed to mount into a standard two-unit high 19” rack frame. Main dimensions are given. The OSD725T and the OSD725R have the same external dimensions.

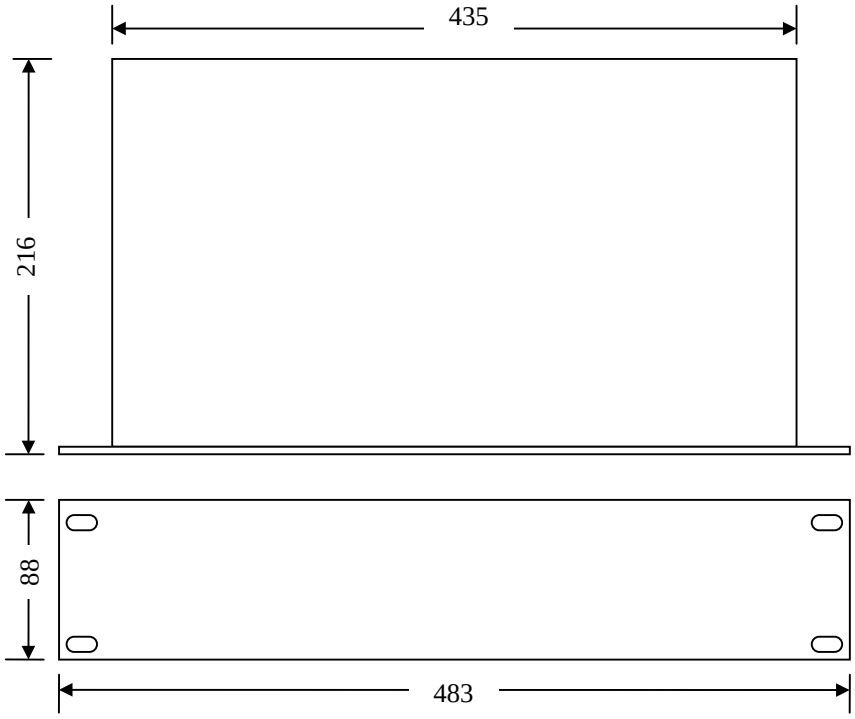


FIGURE 4: OSD725 MOUNTING DIMENSIONS

2.2.4 POWER SUPPLY CONNECTIONS

Connect mains power lead to the IEC socket at the back of the unit. The input power range for the OSD725 is 95 to 265V_{AC} @ 10VA. Switch the power switch to position "1". The green power LED should illuminate and the unit is ready for operation. In the event of a blown fuse, replace with 250V 500mA Anti Surge fuse. Note; for convenience, a spare fuse is supplied inside the fuse holder.

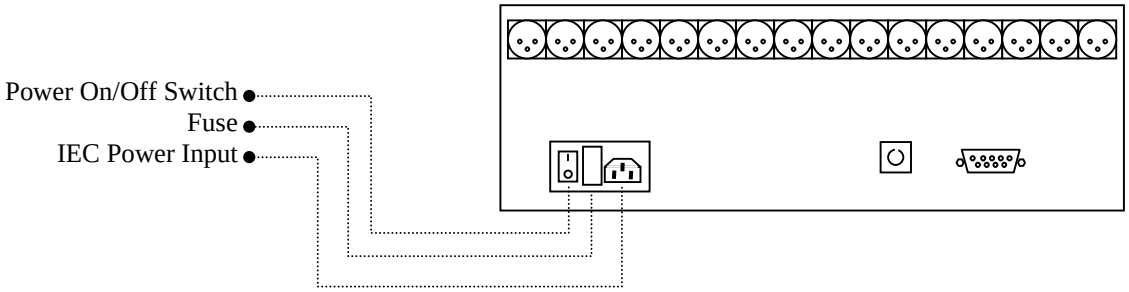


FIGURE 5: OSD725 POWER SUPPLY CONNECTIONS

2.2.5 AUDIO CONNECTIONS

Audio inputs to the transmitter are female XLR sockets
Audio outputs out of receiver are male XLR sockets.
See Section 1.4 for pin connections.

2.2.6 OPTICAL CONNECTIONS

An appropriate optical connector must terminate the optical fibre. Before connection, inspect the end of the connectors to ensure that no dust or dirt is present as it could contaminate or damage connector and result in poor performance.

If it is necessary to clean the cable connectors use isopropyl alcohol and a lint free tissue to remove contamination

2.2.7 ALARM CONNECTIONS

Transmitter

The OSD725T has two LED indicators: "Power On" and "Laser Alarm" on the front panel.

"Power On" illuminates green when power is applied. The "Laser Alarm Indicator" is normally green. It only turns red if the laser is close to the end of its life and draws too much current.

Relay contacts are located on the rear panel utilising the DB9F connector. See Section 1.4 for pinout connections and diagrams.

Receiver

The OSD725R has three LED indicators: "Power On", "Bit Error Rate" and "Link Alarm" on the front panel.

"Power On" is green when power is applied to the receiver.

"Bit Error Rate Indicator" is normally off when the unit is operating with sufficient optical power. It starts flashing when frame errors in the received digital stream are excessive. This can happen if received optical power is below the minimum level or if there is interference to the receiver or transmitter units.

"Link Alarm Indicator" illuminates when synchronisation between receiver and transmitter is lost. Low optical power at the receiver is usually the reason. This is the case when the optical fiber is disconnected or is broken. Check that all optical connectors in all patch panels have been cleaned and inserted correctly.

Relay contacts are located on the rear panel utilising the DB9F connector. See Section 1.4 for pinout connections and diagrams.

2.2.8 LINK SETTINGS

The OSD725T can operate with high impedance or 600Ω balanced inputs.
User settable links for this purpose are located inside the unit next to the XLR connectors. These links are labelled: LK1-16. Each link terminates one channel. For 600Ω operation the links are set in closed position or for 10kΩ the links are removed.

Other user settable links are for floating or grounded shields. These are labelled on the board as LK17-32 for each channel. Each link connects its associated channel's shield to chassis ground. When LK17 to LK32 are open the input signal shield ground becomes disconnected from the unit's chassis. This breaks the ground loops that can be formed by a connected remote signal ground. Ground loops can cause unwanted signal interference and added hum. In some circumstances it may be desirable to place these links in closed positions which will connect the input signal shield ground to the OSD725 chassis.

There are no other user settable links. The links on the optical boards are for factory use only and MUST NOT be touched.

3 MAINTENANCE

3.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD725T and OSD725R 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 audio signals are connected to the modem correctly and that the distant units have 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 OSD725T and OSD725R.

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.

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