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**OPTICAL**

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**SYSTEMS**

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**DESIGN**

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**OPERATOR MANUAL**

**OSD159**

**DUPLEX 8-CHANNEL**

**ALARM/CONTACT TRANSCEIVER**

OPTICAL SYSTEMS DESIGN

**OSD159**

**DUPLEX 8-CHANNEL**

**ALARM/CONTACT TRANSCEIVER**

Document No. 101085 Revision 02

# OPTICAL SYSTEMS DESIGN

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## 1 TECHNICAL SUMMARY

### 1.1 PRODUCT DESCRIPTION

The OSD159 is an add-on 8-channel alarm/contact interface that is either configured as a fiber or a copper transmission system. The system consists of a pair of OSD159s which are designed to provide duplex transmission of 8 contact closure channels.

The OSD159 can be used as a standalone pair (fiber version) or as an add-on to an existing OSD system utilising one available RS232 data channel (copper version).

The OSD159 is available in two physical configurations: card or module. The card versions are 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 versions are intended for isolated use and require an external power source.

The OSD159 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.

#### 1.1.1 APPLICATIONS

- ▲ Security monitoring or access control systems
- ▲ Simple remote control systems
- ▲ Transmission of open/closed contacts

#### 1.1.2 FEATURES AND BENEFITS

- ▲ Enables up to 8 duplex alarm conditions to be transferred via one RS232/TTL data channel
- ▲ Both card or standalone module versions are available
- ▲ Available as either a fiber optic modem or as an RS232 based copper modem
- ▲ RS232 version can work with any OSD fiber optic modem which has at least one spare data transmission channel
- ▲ Complete end-to-end isolation either as a fiber optic unit or as an RS232 link working in conjunction with other OSD fiber modems

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## 1.2 TYPICAL CONFIGURATION

Figure 1 below indicates the typical set-up for an OSD159 system.

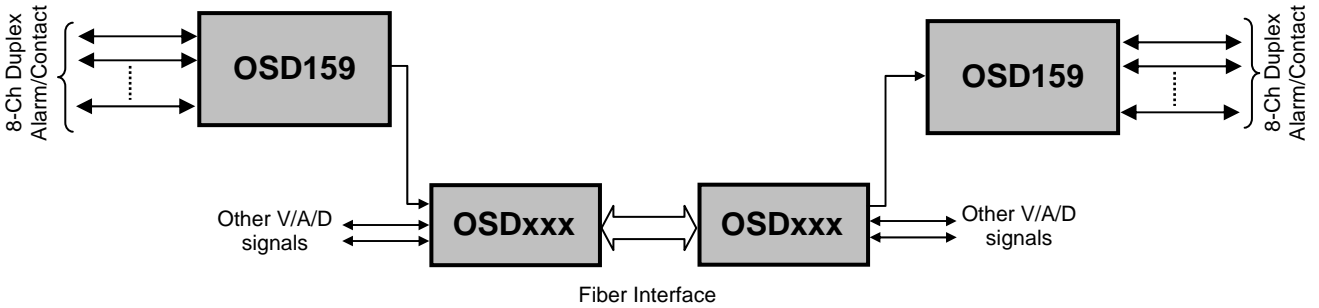


FIGURE 1: OSD159 TYPICAL CONFIGURATION

## 1.3 PRODUCTS AND OPTIONS

There are various options available for the OSD159 as identified in Table 1 below:

**OSD159**    C    FL    (example only)

1    2

TABLE 1: PRODUCTS AND OPTIONS

1	ITEM	DESCRIPTION
	-	Card Version
	C	Standalone Module Version

2	ITEM	DESCRIPTION
	FM	Multimode operation
	FL	Singlemode operation

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## 1.4 TECHNICAL SPECIFICATIONS

Table 2 below provides Technical Specifications for the OSD159.

TABLE 2: TECHNICAL SPECIFICATIONS

SPECIFICATION	PERFORMANCE
Capacity	8 Duplex Channels
Sampling Rate	480Hz
Copper Line Interface	Buffered and protected, open/closed sensing, contact closure from IN to GND will close alarm receiver N/O
Input Loop Resistance	External closed loop, 1000Ω max
Output Interface	Optically isolated MOSFET (80mA @ 200V DC or AC with <35Ω On resistance
Electrical Connector	25 pin D subminiature connector
Optical Wavelength	850 ± 40nm for OSD159FM 1310nm ± 40nm for OSD159FL
Transmitter Optical Power	>-15dBm
Receiver Sensitivity	<-40dBm for 1x10 <sup>-9</sup> BER
Receiver Saturation	>-7dBm
Optical Link Budget	>25dB at 850nm (>6km of multimode fiber) >25dB at 1310nm (>20km of multimode fiber, >50km of singlemode fiber)
Optical Connectors	ST standard
Indicators	Link status (Green: Link OK; Red: Link Faulty)
Link Alarm	MOSFET switched to GND on Pin 4 of terminal block when link is OK (Rated at >1.0A @ 30VDC)
Copper Line & Alarm Connector	4 position terminal block
Dimensions (mm)	114W x 106D x 32H (module) 25W x 208D x 100H (card)
Weight	0.2kg (module), 0.15kg (card)
Power Requirements	8 to 40VDC or 15 to 26VAC at 3VA maximum via 2 pin connector
Operating Temperature	-20°C to +75°C
Relative Humidity	0 to 95% non-condensing

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## 1.5 PIN ASSIGNMENTS

Pin assignments for the “Alarm/Contact Input/Output” DB25F connector (Figure 2) is shown in Table 3 below.

TABLE 3: PIN ASSIGNMENT

Pin Number	Function	Pin Number	Function
1	GND	14	Input 1
2	Input 2	15	Input 3
3	Input 4	16	Input 5
4	Input 6	17	Input 7
5	Input 8	18	Normally Open 1
6	Common 1	19	Normally Open 2
7	Common 2	20	Normally Open 3
8	Common 3	21	Normally Open 4
9	Common 4	22	Normally Open 5
10	Common 5	23	Normally Open 6
11	Common 6	24	Normally Open 7
12	Common 7	25	Normally Open 8
13	Common 8	-	-

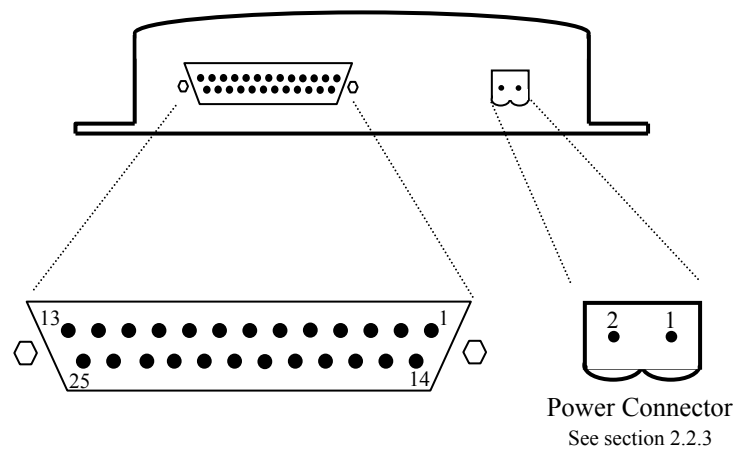


FIGURE 2: DB25F CONNECTOR AND POWER CONNECTOR

## 2 INSTALLATION AND OPERATION

### 2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD159 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.

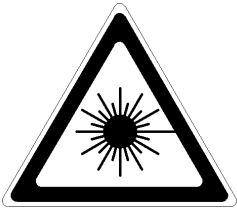
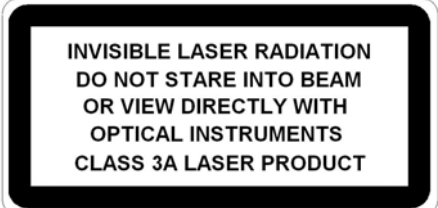
### 2.2 INSTALLATION

#### 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

Class 1	Class 3A
<p>The multimode version of the OSD159 is a <b>Class 1 LED product</b>. Wavelength of 850nm and &lt;-8dBm power output.</p>	<p>The singlemode versions of the OSD159 are <b>Class 3A laser products</b>. Wavelength of 1310nm and &lt;+5dBm power output or wavelength of 1550nm and &lt;+7dBm power output.</p>
	

#### PRECAUTIONS

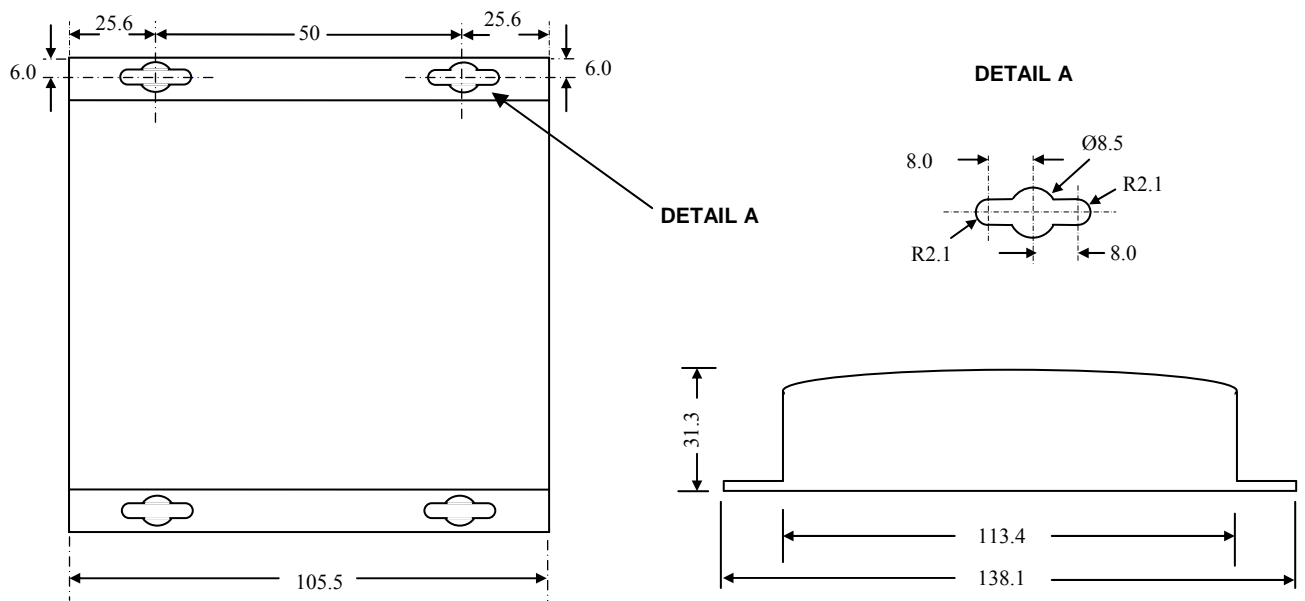
- ▲ All service personnel should be provided training as to the hazards of direct viewing of laser radiation and of the precautionary measures during servicing of equipment
- ▲ Areas where laser products are installed should be restricted in access to trained service personnel only and appropriate warning 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.



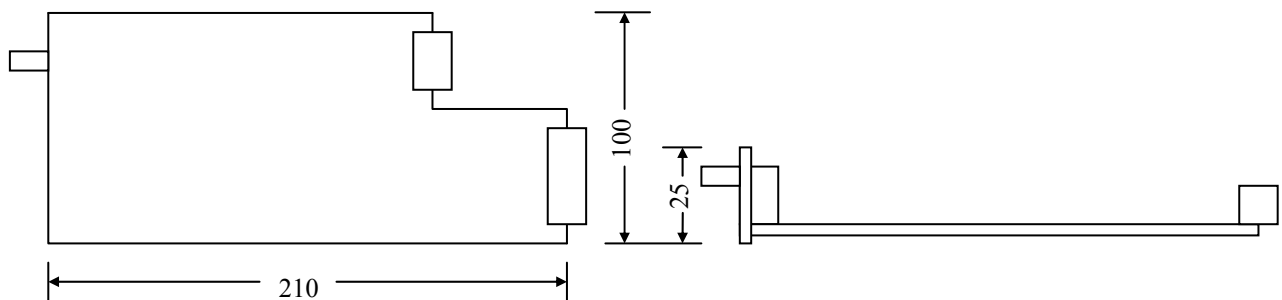
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## 2.2.2 OSD159 DRAWINGS AND DIMENSIONS

The OSD159 module version is designed to be mounted on an even surface and to be secured by means of M4 or smaller screws. The OSD159 card version is designed to be inserted into a chassis and secured by means of captivated screws.



(a) Module Version



(b) Card Version

FIGURE 3: OSD159 MOUNTING DIMENSIONS

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## 2.2.3 POWER SUPPLY CONNECTIONS

The OSD159 card version is powered from the OSD370 or OSD350 chassis. DC power on the OSD159 card version is connected via the DB9 connector. The card version of the OSD159 should be fixed into the OSD370 (or OSD350) chassis using the captivated screws. The card can be plugged in or out of the OSD370 (or OSD350) chassis with power on or off.

The OSD159 module requires external DC power. The voltage range of the OSD159 is +8 to 40VDC or 15 to 26VAC at 3VA maximum. Power should be connected to the power socket located at the back of the case as indicated in Table 4.

TABLE 4: DC OR AC POWER CONNECTION

External Power Pin	Specification
Pin 1	8 to 40VDC or 15 to 26VAC at 3VA maximum
Pin 2	Ground – 0V

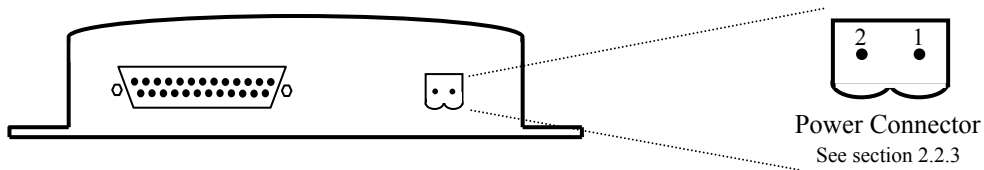


FIGURE 4: OSD159 POWER SUPPLY CONNECTIONS

## 2.2.4 OTHER CONNECTIONS

The OSD159 Copper version has a 4 way terminal block connector on front side while the OSD159 Fiber version has a 2 way terminal block connector.

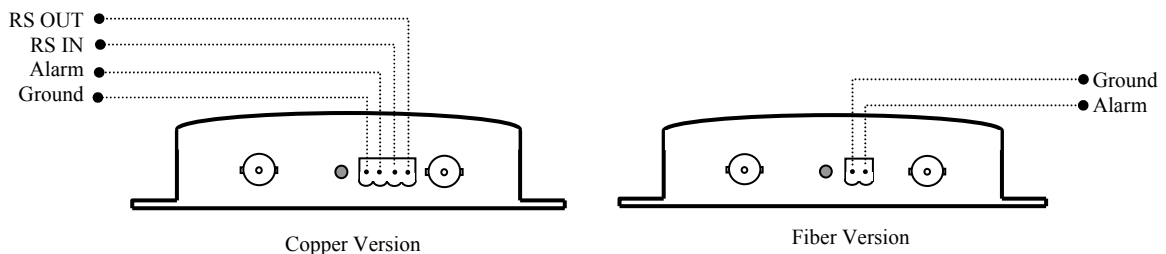


FIGURE 5: OSD159 CONNECTIONS

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Contact Closure Input/Output signals are connected to the DB25F connector as set out in Table 3.

For the OSD159 Copper version, RS In and RS Out is used to connect the link pair with copper wire to an existing OSD system with one available RS232 channel (as in Figure 1) or directly from one OSD159 unit to another.

For the OSD159 fiber version, 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.

Receive Alarm is an alarm signal that can be connected to control external sources (eg, LED indicator) to indicate if there is a loss of received signal when the OSD159 LED indicator turns 'red'. Output is controlled by a MOSFET that is switched to ground when link is OK (Rated at  $<1.0A @ 30V_{DC}$ ).

## 2.2.5 CONTACT CLOSURE CONNECTIONS

The OSD159 has eight contact closure channels. The contact closure inputs (Table 3) is driven high. To operate the contact closure, the input should be switched to ground (see Figure 6).

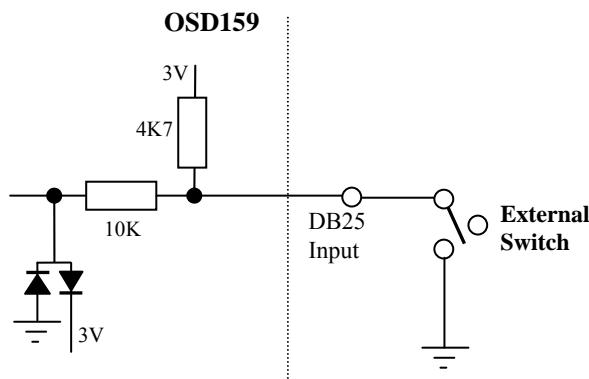


FIGURE 6: CONTACT CLOSURE INPUT

The contact closure common outputs are on pins 6, 7, 8, 9, 10, 11, 12, and 13 while the normally open contacts are connected to pin 18, 19, 20, 21, 22, 23, 24, and 25 of the DB25 connector. Maximum ratings the OSD159 relay can drive is  $80mA @ 200V_{(max)}$ .

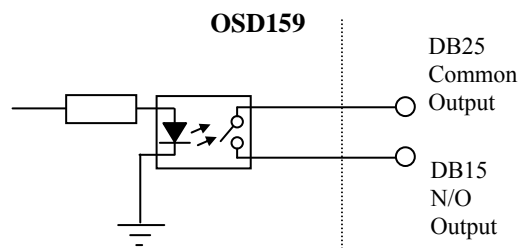


FIGURE 7: CONTACT CLOSURE OUTPUT

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## 2.3 OSD159 OPERATION

When using the OSD159 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 indicator illuminates accordingly on power up (see Table 5). If a module version is used, connect the unit to an appropriate power source and check that the indicator illuminates accordingly on power up (see Table 5).

Plug in the optical connectors of the optical cable. If the set-up is connected correctly, the OSD159 "Link OK" LED will change from 'Red' to 'Green'.

Plug the digital signal source (data/contact closure) into DB25 connector on the rear of the module. Ensure that the correct signals are connected to the correct pins of Data Input/Output connector as specified in Table 3.

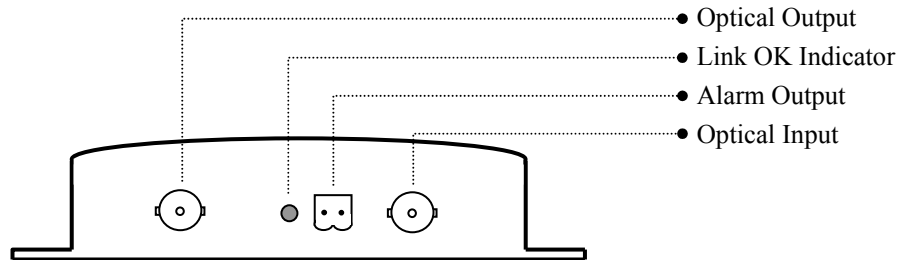


FIGURE 8: OSD159 FRONT SIDE VIEW

### 2.3.1 OSD159 INDICATORS

TABLE 5: OSD159 INDICATOR FUNCTION

INDICATOR	PARAMETER	COLOUR	FUNCTION
LINK OK	Link Status	Red	No link established
		Green	Link established

## 3 MAINTENANCE

### 3.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD159 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 data signals are connected to the modem correctly and that the distant OSD159 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 OSD159.

## 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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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](mailto:sales@osd.com.au)

Web Site: [www.osd.com.au](http://www.osd.com.au)

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