OPTICAL SYSTEMS DESIGN

OPERATOR MANUAL

OSD170

G.703 PCM

FIBER OPTIC MODEM

INDEX

1 TECHNICAL SUMMARY

1.1 BRIEF DESCRIPTION

The OSD170 is a low cost, high performance PCM terminal designed primarily for in-house links such as PABX interconnects, 2.048Mbps data switch links and the like. It operates essentially as an adjustable bandwidth analog link optimized for the transmission of balanced ternary signals with peak amplitudes of 2.37V.

The basic form of the OSD170 does not provide any regeneration, as in its major application, regeneration is provided by the customer's equipment. As a consequence, depending on the bandwidth setting, the received signals may be outside the G.703 interface pulse masks.

The operational wavelengths can be either 850nm or 1300nm. There is sufficient power coupled into a standard 10/125um single mode fiber to allow useful distances to be spanned, for example up to 40km at 2.048Mbps when operating at 1300nm.

The OSD170 is available in a self-contained case which occupies half a modem tray in a standard 19" rack.

1.1.1 APPLICATIONS

▲ PABX - PABX links

▲ G.703 backbone networks

▲ Mine communications

▲ Secure networks

1.1.2 FEATURES AND BENEFITS

▲ Interfaces with any balanced ternary line code in the range 300kbps to 5Mbps such as G.703 systems operating at 1.544Mbps and 2.048Mbps.

▲ Available with operating wavelength of either 850nm or 1310nm

▲ Operates with both singlemode and multimode fibers over up to 100km.

▲ Compatible with CCITT Rec. G.703.

▲ May use 120V, 240V AC or 48V DC power sources.

▲ User adjustable optical power level.

▲ Austel approved

1.2   TECHNICAL SPECIFICATION

SPECIFICATION	PERFORMANCE			
Data Rate	300kbp to 5Mbps balanced ternary line code			
Receiver Bandwidth	5MHz			
Electrical Input	G.703 or similar line codes to 2.048Mbps at 75Ω unbalanced Minimum level 6dB below nominal			
Electrical Output	Replica of input with +2.37V peak (nominal) level band limited to 5MHz at 75Ω.			
Indicators	Electrical Input Signal Present Optical Input Signal Present Power			
Alarm Contacts	Isolated changeover relay contacts for electrical input signal present and optical input signal present available on 9 pin D connector			
Wavelength	850 or 1300nm nominal			
Coupled Transmit Power	**Version**	**Wavelength**	**Coupled Transmitter Power**	**Fiber Type**
	OSD170S	850nm	-16 to –14dBm	62.5/125
	OSD170L	1310nm	-23 to –17dBm -16 to –9dBm	10/125 62.5/125
	OSD170LD	1310nm	-7 to –3dBm	10/125
	OSD170HLD	1310nm	0 to +4dBm	10/125
Optical Power Control	5dB nominal, user selectable			
Receiver Sensitivity	<-34dBm for 1 x 10^{-9} BER			
Receiver Saturation	>-15dBm			
Signal Connector	BNC			
Alarm Connector	9 Pin Female D Connector			
Control	Transmit Power			
Optical Connectors	ST standard, but others are available			
Operating Temperatures	0 to 50°C			
Relative Humidity	0 to 95% non condensing			
Power Requirements	Standard: 120/240V_{AC} ± 10% 47-63Hz @ 10VA -48V Option: 20V_{DC} to 72V_{DC} Current draw 200mA @ 48V_{DC}			
Weight	1.5 kg			
Dimensions (mm)	215W x 210D x 56H			

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Table 1: Technical Specifications

2 INSTALLATION AND OPERATING INSTRUCTIONS

2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD170 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

▲ **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 OSD170 is a **Class 1 laser product.**
CLASS 1 LASER PRODUCT
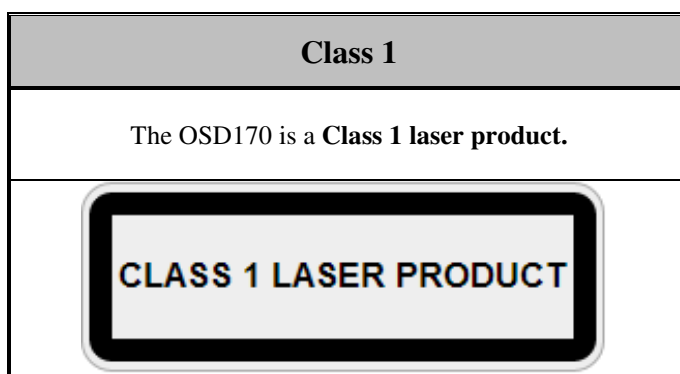
PRECAUTIONS

▲ 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.

2.3   PACKAGING

The standalone version is housed in a metal case, which is designed to be placed on a bench, or on top of other equipment and adjacent to another similarly sized unit in a 19" rack.

2.4   POWER SUPPLY CONNECTION STANDARD OSD170

The standard versions operate from a 120/240V, 47-63Hz AC source via an IEC mains cable. The mains plug must include the earth connection.

The unit is fitted with a 100mA antisurge fuse in the power entry module.

The modem is switched on by switching the rear panel rocker switch to the position as indicated by the "1". The green power LED on the front panel will indicate that power is available to the unit.

2.5   POWER SUPPLY CONNECTION -48VDC VERSION

This version operates from an external -48VDC source. The -48VDC power supply that is connected to the OSD170-48 must be an Austel approved power supply.

Wire the supply voltage to the socket provided as per Figure 1. The wire that is marked PROTECTIVE EARTH in Figure 1 must be connected to protective earth (mains ground) by a licensed electrician. This wire is connected to the case and circuit ground of the OSD170.

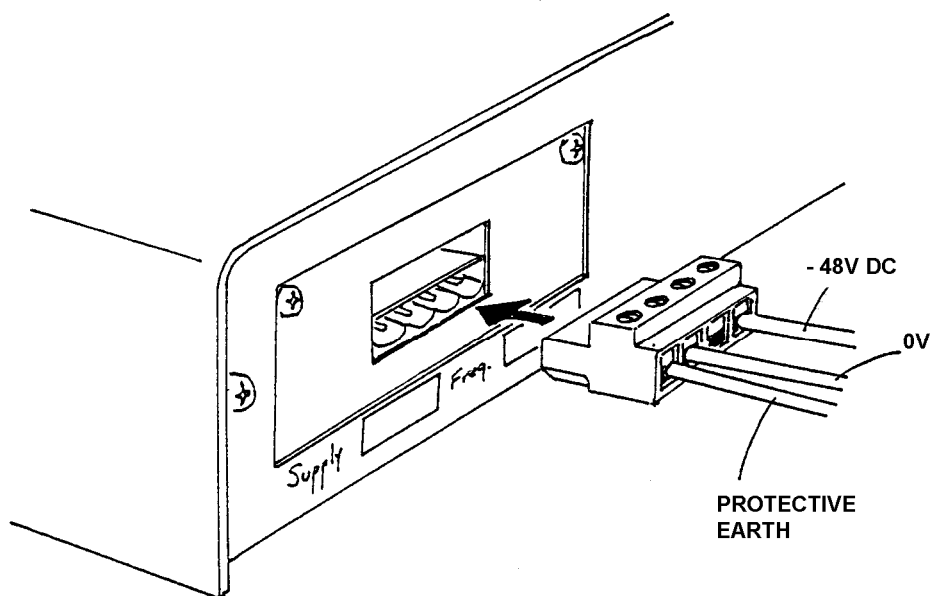The green power LED on the front panel will indicate that power is available to the modem.

Figure 1. -48VDC Power Supply Connection

2.6   OTHER CONNECTIONS

Input (Rx) and Output (Tx) BNC connectors on the rear of the modem should be connected to the appropriate ports of the host equipment via standard 75ohm cable such as RG59.

The fiber must be terminated by the appropriate optical connector. Before connection, inspect the end of the connectors to ensure that no dust or dirt is present as it could contaminate the modem connectors 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.

Using only hand pressure, connect the fiber connector onto each optical termination.

Set the rear panel mounted **Optical Power** switch to either **High** or **Low** depending on the link distance required. Table 2 is an approximate guide to the setting of the power level.

	850nm Wavelength		1300nm Wavelength	
	Switch -Low	Switch- High	Switch -Low	Switch- High
10/125μm fiber	-	0 – 2km	0 - 15km	0 - 40km
50/125μm fiber	0 - 4km	1 - 6km	0 - 20km	10 - 40km
62.5/125μm fiber	0 - 5km	2 - 8km	0 - 20km	10 - 40km

Table 2: Link Distances

The relay contact connector, a 9 pin D connector (female), is located on the front panel. The pin description is given in Table 3.

Signal	Pin	Signal	Pin
Ground	1	Tx Closed (signal present)	6
Rx Closed (signal present)	2	Tx Common	7
Rx Common	3	Tx Open	8
Rx Open	4	Ground	9
No Connection	5		

Table 3: Alarm Connector Pin Description.

2.7 WARNINGS

The use of this equipment in a private network is subject to AUSTEL Technical Standard TS012 and other items and conditions of the AUSTEL Service Providers Class License.

The unit must be installed in a restricted-access location. Installation and maintenance must be restricted to suitably qualified personnel. The unit is not user accessible.

This equipment must only connect to the carrier's network only via authorized customer equipment and must not directly connect to an interface provided by an external carrier.

This is a Class A EMC product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

2.8 CONTROLS

There are two control switches accessible in normal operation. Both are located on the rear panel.

MAINS   1 indicates ON position.

OPTICAL POWER   High selects maximum optical output power
                                       Low selects a level 5dB lower than High setting.

2.9 INDICATORS

Three front panel mounted light emitting diodes are used to indicate the status of the modem and the optical link.

ON   Lights green to indicate that the modem is on.

TX DATA   Lights amber to indicate data is being transmitted.

RX DATA   Lights amber to indicate data is being received.

3   MAINTENANCE

3.1   INTRODUCTION

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 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 OSD170.

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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