STM-1 O/E Converter

User Manual

Revision 1.0

2004/9

Note: Every effort is made to ensure that material printed in this manual is accurate until release. However we reserve the right to make improvements without prior notice.

STM-1 O/E Converter

Operation Manual

1. Introduction

The STM-1 O/E Converter is designed to provide A and B two converters between electrical interface and optical interface of STM-1 signal. The converters features compactness, light weight, low power consumption and high reliability.

The STM-1 O/E Converter operates on 1.31μm lasers, with a typical transmission distance of 40 km over single mode optical fibers. For longer hops, 1.55μm laser sources may be selected.

Exterior power supply, all the functional blocks are integrated on a single PC board, which makes the modem compact and reliable. 220 V AC or -48 V DC power options are available by selecting an appropriate plug-in power unit.

The two converters enclosure is a standard 19" wide 1U metal box, suitable for rack mounting, or as a desk top unit.

2. Typical application

The STM-1 O/E Converter provides two converters between electrical interface and optical interface of STM-1 (155.520Mbit/s) signal of SDH or ATM network. The typical application is given below.

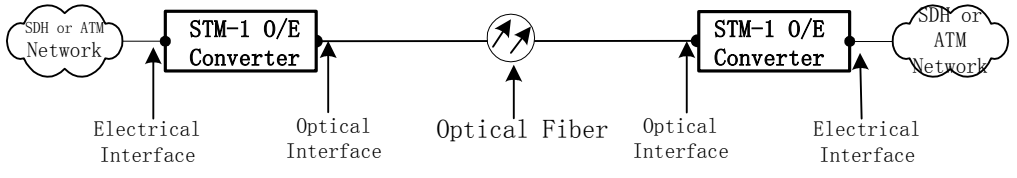


Fig. 1 Typical application example

3. Panel arrangement

3.1. Front panel arrangement

The front panel of STM-1 O/E Converter is as shown below,

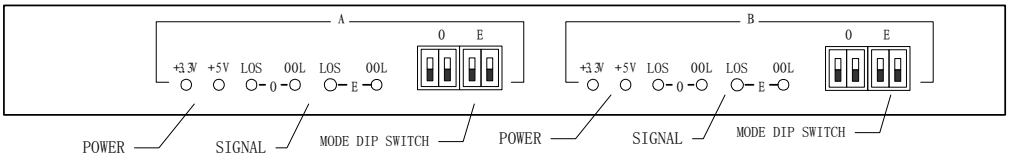


Fig. 2 Front panel

There are green, red and yellow LEDs on the front panel of the STM-1 O/E Converter. The following table lists meaning of all the LEDs and possible causes. The A and B converters are same.

Table 1 LED descriptions

LED	Color	Meaning when lit	Note
+3.3V	green	3.3V Power switch on and OK	The A and B converters are same
+5V	green	5V Power switch on and OK	
O-LOS	red	Loss of optical signal	
O-OOL	yellow	Unlock alarm of synchronization in optical signal	
E-LOS	red	Loss of electrical signal	
E-OOL	yellow	Unlock alarm of synchronization in electrical signal	

There are 8 DIP-switches in the front panel. They are used to set working mode of converters. Each of A and B two converters have 4 DIP switches. The following tables lists 4 DIP switches description. The A and B converters are same.

Table 2 4 DIP switches description

Working mode	4 DIP states				Description
	DIP-1	DIP-2	DIP-3	DIP-4	
1	off	on	on	on	R x ~ Tx remote loop in optical
2	on	off	on	on	Rx ~ Tx local loop in optical
3	on	on	off	on	R x ~ Tx remote loop in electrical
4	on	on	on	off	Rx ~ Tx local loop in electrical
5	on	on	on	on	Normal O/E converter
NOTE. 1. The "on" is down, "off" is up for each DIP. 2. The A and B converters are same.					

Table 3 Working modes description

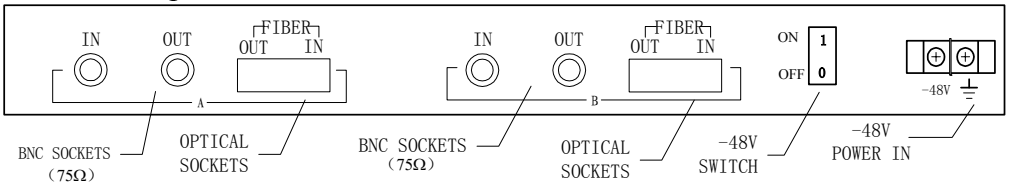
Working modes	Optical STM-1	Electrical STM-1
Loop test state	mode1	mode3
	mode2	mode4
Normal O/E converter	mode5	
NOTE. The A and B converters are same.		

3.2. Rear panel arrangement

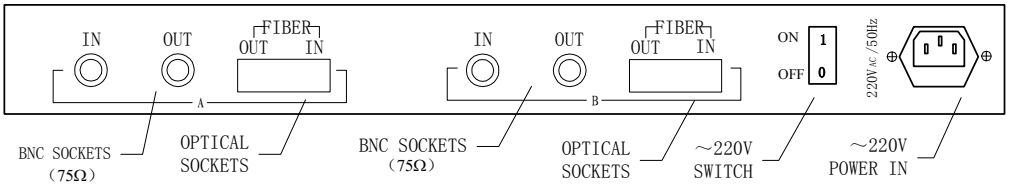
There are STM-1 optical interfaces, STM-1 electrical interfaces, power switch and power in port in Rear panel.

There are two types of The STM-1 O/E Converter, ~220V AC and – 48V DC, according to the power supply. Both of their rear panels show in following figures.

The rear panel of STM-1 O/E Converter is shown below,



(a) -48V DC power supply panel



(b) ~220V AC power supply panel

Fig. 3 Rear panel

For A or B STM-1 O/E Converter, the STM-1 electrical interfaces are BNC sockets, "IN" is incoming STM-1 electrical signal and "OUT" is outgoing STM-1 electrical signal. And the STM-1 optical interfaces are SC type or FC type sockets, pay attention to the input and output relationship. Do not bend fiber to sharp angles to prevent damage. **Do not look directly into the fiber end or the Tx connector socket for extended time; it may be harmful to the eyes.**

3.3. Loop backs

The STM-1 O/E Converters support panel DIPs switch control of loop backs to allow for installation and maintenance checks.

4. Installation

4.1. Mechanical

The dimension of the STM-1 O/E Converters is shown below.

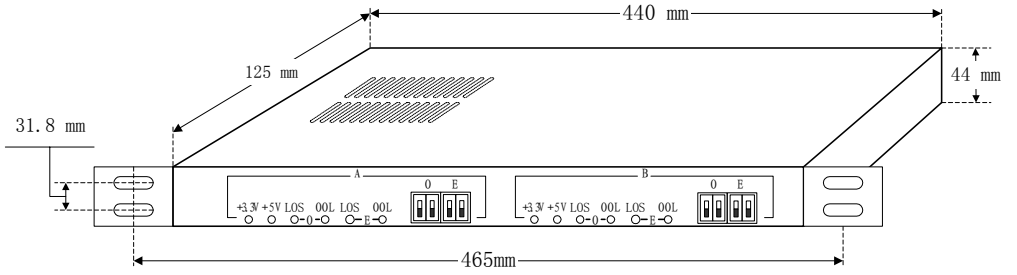


Fig. 4 Mechanical dimension

4.2. Electrical

4.2.1. Power connection

Plug-in power unit is installed inside the power chamber. Two types of power units are available, 220V ac, or –48V dc.

When AC unit is installed, the power inlet, a fuse, and a switch are integrated with the unit , as shown in the diagram below.

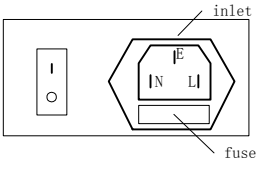


Fig. 5 AC power module

Use the power cord supplied with the STM-1 O/E Converters. Plug in the power cord to the ac power inlet at the back of the power chamber. Be sure to use a wall outlet with correct voltage and a secure earth connection.

When –48V DC power is selected, a cover plate is fixed on the chamber by screws. –48V DC power connector is on the right side of the power chamber. Connect to –48V power source using a pair of wires about 1mm in diameter to the power-in connector. Remove about 10mm of the protective insulator from the wire end. Prepare the wire end with solder. Push inward the yellow release lever on top of the connector with a screw driver, plug the prepared wire end well into the hole, then release the push.

4.2.2. STM-1 electrical connections

There are BNC sockets for 75Ωcoaxial STM-1 electrical interface for A or B converter.

4.2.3. STM-1 fiber connection

Use SC or FC type connectors to connect the STM-1 O/E Converters to the transmission cable. Pay attention to the input and output relationship. Do not bend fiber to sharp angles to prevent damage. **Do not look directly into the fiber end or the Tx connector socket for extended time, it may be harmful to the eyes.**

5. Operation and maintenance

When all the connections are down, switch on the Converters. Observe all the alarm LED's for any possible installation errors. Check the output optical power using an optical power meter. The reading should be within specification.

Measure the optical power at the receiver end. Make sure that the power level is between the maximum allowable input power and sensitivity given in the specification. It is preferred to leave a margin of few dB's for stable operation.

6. Specifications

6.1. Capacity

A and B two STM-1 O/E converters.

6.2. STM-1 Optical interface

ITU-T G.957 STM-1.

Line rate:	155520 kbps
Line code:	Scrambled NRZ
Wavelength:	1.31 μ m(typical)
	1.55 μ m(optional)
Connector:	SC or FC
Optical:	S1.1 (typical), L1.1(optional)

6.3. STM-1 electrical interface

ITU-T G.703

Bit rate:	155520 kbps±20ppm
Line code:	CMI
Impedance:	75Ω (unbalanced)

6.4. Power

DC type: -48V（-36V to -60V）
AC type: ~220V（165V~265V）
Power consumption: ≤3W

6.5. Working environment

Temperature: 0 ~50°C
Humidity: ⩽90% non condensing

6.6. Dimension

Width: 440mm
Height: 44mm
Deep: 125mm