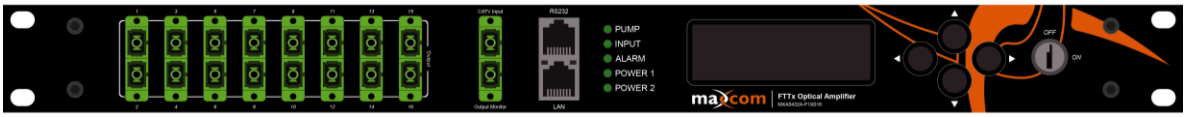
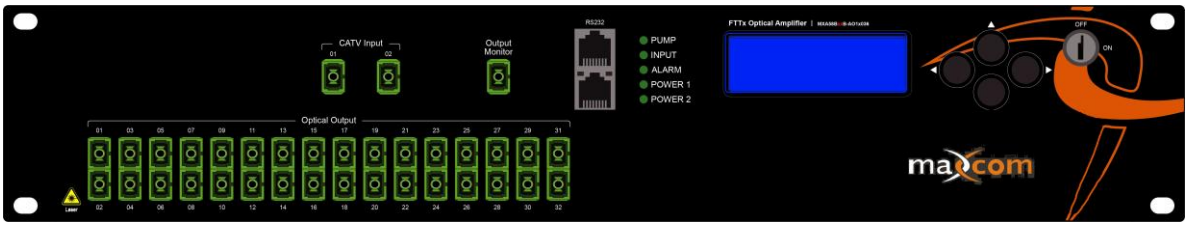
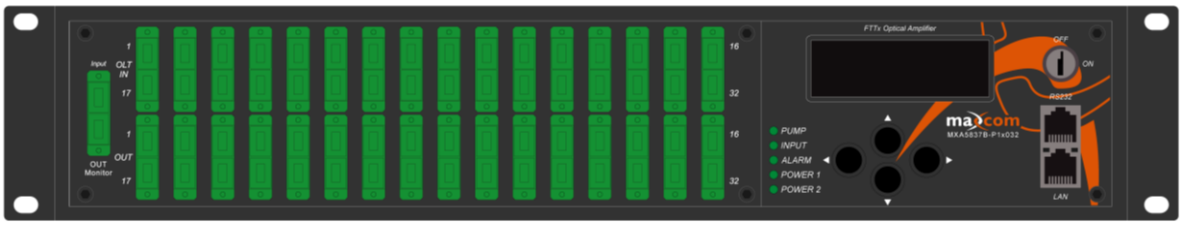
1550NM ERBIUM DOPED FIBER AMPLIFIER · MX-A54 SERIES MULTI-PORT

OPERATOR GUIDE







Sample Illustrations of MXA54 Series

Available in several configurations, sizes, and number of output ports

PRODUCT SUMMARY

The Maxcom MXA54 Erbium Doped Fiber Amplifier (EDFA) has been designed for CATV, FTTH and HFC applications. The EDFA is suitable for long haul transmission networks or FTTH distribution networks. This optical amplifier is packaged in a 19" rack mount housing to provide a complete optical communications solution. Maxcom offers our MXA54 platform which can be ordered with 8, 16, 32 and 64 output ports and various output powers.

The output power available is from 16.5 dBm to 23 dBm or may be customized.

The MXA54 series is a high-power multi-port EDFA with a gain spectrum band within 1540~1563nm. It is designed for the application of a single channel or 1~8 continuous ribbon channels (ITU wavelengths). This series of EDFA offers a flexible and low-cost solution for a CATV systems large coverage area.

The MXA54 series EDFA's are a high performance, multiple optical output EDFA's designed for analog and digital CATV QAM signals. Maxcom's 1550 optical amplifiers and EDFA's adopt world class pump lasers and American OFS erbium-doped optical fiber components. Excellent APC, ACC and ATC control, superb design in the ventilation and heat-dissipation ensure long life and an exceptionally reliable operation of the pump laser.

The LCD at the front panel offers equipment status and warning alarms. The laser will switch off automatically if optical power is lost, which offers security protection for the laser

Assembly and Power Connections

A. Equipment should be mounted in a 19-inch chassis or cabinet.

B. The optical amplifier is designed to work within the temperature range 5°C~50°C (23°F~122°F). Maxcom suggest a target environment temperature of 25°C(77°F).

   Humidity should not exceed 85%. A dust free environment is desirable, however if dust is present, clean the fans periodically as needed to maintain good air flow and cooling to prevent the unit from overheating.

C. The equipment may operate with AC or DC power supplies and uses optional dual power supplies for redundancy.

D. Establish a good ground connection to the chassis. If using AC power, according to international standards, 120VAC connections adopt three-wire systems, the center wire is the ground.

E. Clean Optical Connectors before use.

Fiber Connections

Cleaning fiber-optic connectors can help prevent interconnect problems and therefore, aid system performance. When optical connectors are disconnected and reconnected, the fiber surface may become dirty or scratched. The goal of cleaning the fiber optic connectors is to remove all dust and contaminants without leaving any residue.

DO NOT connect or disconnect optical jumpers/connectors when unit is on and in operation (switched on)! Connector surface may become damaged or burned by HIGH LASER POWER Level. Unit must be switched to off position prior to any type of connection being made to unit. In case of accidental damage where levels are displayed normally on screen, but low on the output port, the optical connector may be changed or replaced to restore normal levels.


CAUTION:

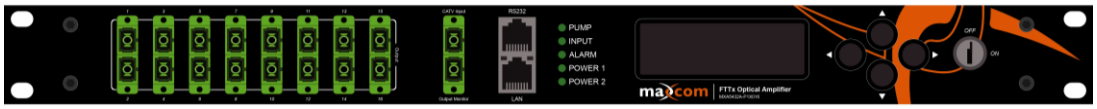
For high power optical levels, in particular to high power optical transmitters and EDFA's, extra cation should be used. Fiber connectors can be burned or melted, arcing may occur, damage may occur to any device that a connector comes in contact with. Extreme caution and safety practices should be observed to avoid contact with eyes and skin. To avoid injury and microscopic damage to fiber mating surfaces, turn off optical power before making or breaking optical connection.

EDFA Controls, Indicators, and Alarms

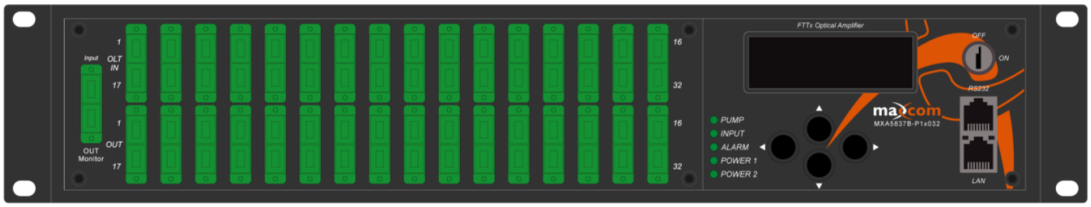
This section of the manual will give an overview of the available menu items in the MXA54 series EDFA and their descriptions. All instructions in Section 3.0 refer to the representation of the front panel shown in the diagram below. The user can scroll through the EDFA menu items by using the push buttons that are on the front panel and are located in the right of the LCD screen.

*Note, some models may have different configurations and button displays

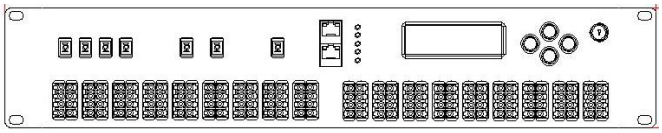
MXA54 1RU Style:



MXA54 2RU Style:



Operation of the panel



Indicator lamps

PUMP- Status lamp Red
INPUT- Status lamp Red
ALARM - Status lamp Red
POWER1 - Status lamp Green (no light when power is off)
POWER2 - Status lamp Green (no light when power is off)

Start-up main menu

Press ▲\▼ button, the following menu items will be displayed in sequence.

Start-up main menu

Press ◄\► button and the following menu will be displayed in sequence.

1. Model

Read-only menu, indicates the type of this equipment

2. S/N

Read-only menu, indicates the serial number of this equipment

3. State of Laser

Adjustable parameter, displays the State of Laser ON/OFF

4. Input

Read-only menu, indicates the input optical power of EDFA

5. Set Output

Adjustable parameter, set the output power

6. Total Output

Read-only menu, displays the total output power of EDFA

7. Each Output

Read-only menu, indicates the output power of each port.

8. PA Current

Read-only menu, indicates the PA current of the EDFA

9. PA Temp

Read-only menu, displays the PA temperature of the EDFA

10. BA Current

Read-only menu, displays the BA current of the EDFA

11. Power1

Read-only menu, displays the status of power1

12. Power2

Read-only menu, displays the status of power2

13. Unit Temp

Read-only menu, display temperature of the unit

14. IP

Adjustable list, IP address setting menu

15. SUB

Adjustable parameter, subnet mask setting menu

16. GW

Adjustable parameter, gateway address setting menu

17. TR1

Adjustable parameter, trap address setting menu

18. TR2

Adjustable parameter, trap address setting menu

19. LCD Contrast Level

Adjustable parameter, adjust the contrast level of the display

20. Reset Settings

Adjustable parameter, reset settings

Modifying Settings

You can easily navigate the menu by using the arrow buttons to select and modify settings as desired.

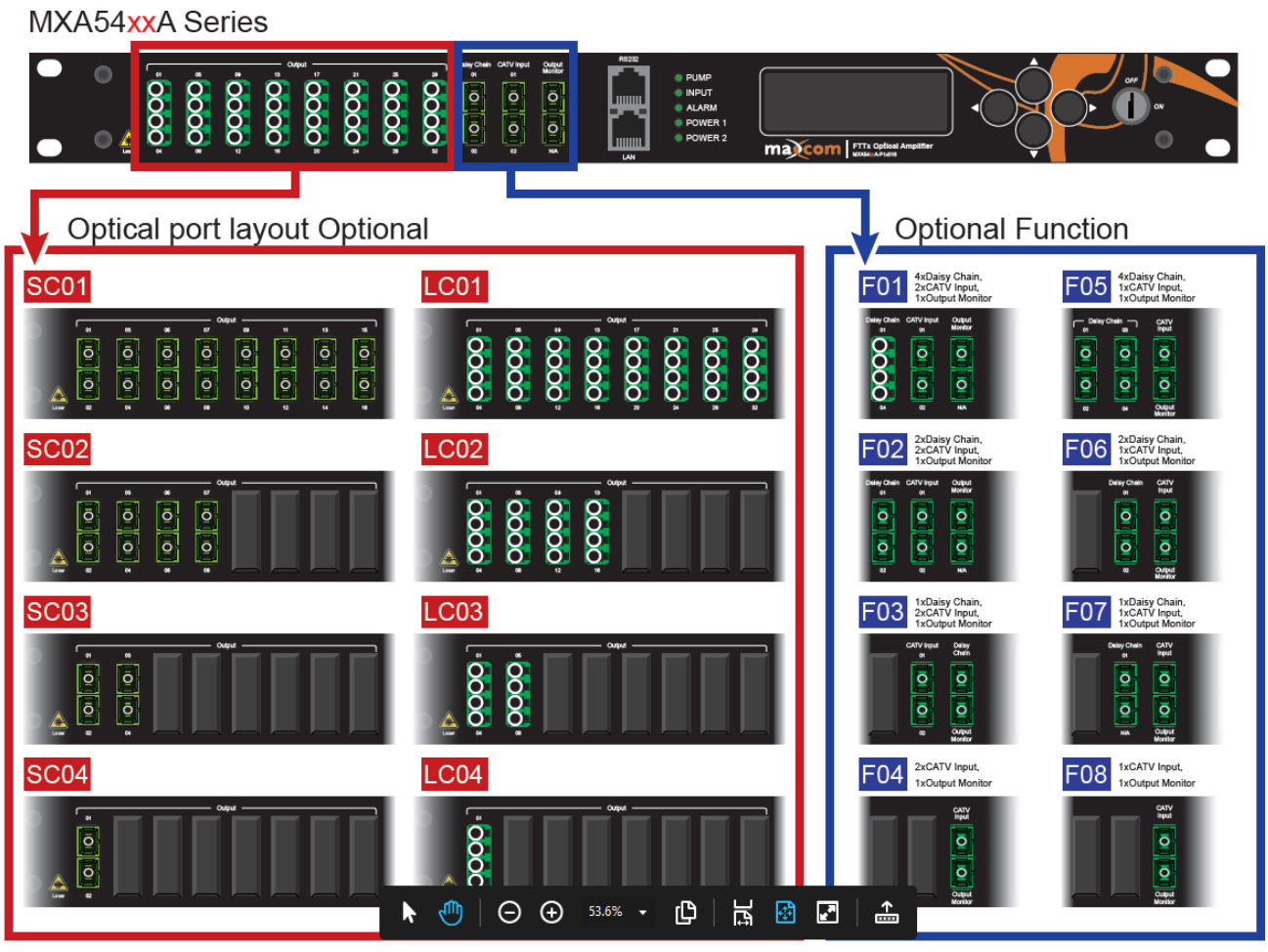
For example, Press ▶ key to amend the address menu item that needs to be modified, press ▶ to shift the value, push ▲\▼ to increase/decrease value, then shift the value to the next digit as desired, press ▶ to the save, press ◀ all the way to the left and exit.

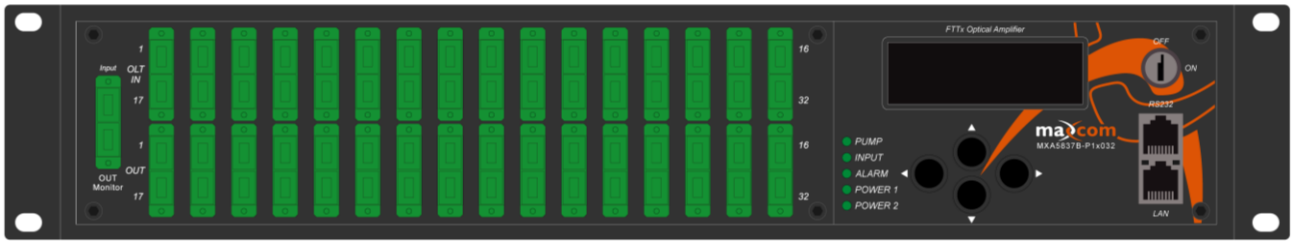
For example, amend IP setup menu, IP: 192.168.000.015; if changing 5 to 6, use ▶ key to choose the place of 5, then press ▲ key to change 5 to 6, then press ▶ to save amended IP:192.168.000.016

Maxcom EDFA's

Maxcom EDFA's are available in many configurations based on the customers request and the requested connector types.

The drawings below illustrate the various forms and connector types. This provides a very flexible platform to accommodate most customer requirements.





PORT AND CABLE ASSIGNMENTS

The MXA54 series provides the following management port:

RS232 port: suitable for examining the MXA54 parameters and system configuration by a PC RS232 port.

SNMP: Simple network management protocol.

Before connecting the MXA54 series to a port, please read the following instructions and port connectivity requirements.

Management Port (RJ-45)

Port Description

The MXA54 series management port connector type is RJ-45.

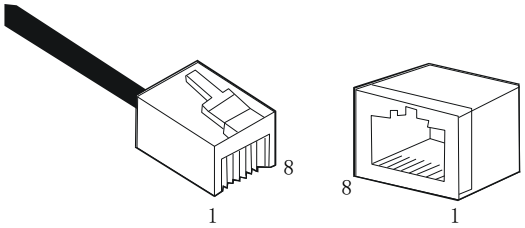


Figure 4.1.1 RJ–45 Connector Plug and Socket

The Management port (RJ-45) can be connected to any device that uses a standard network interface (e.g., a workstation, server, bridge or router). A RJ-45 MDI may be connected with similar network equipment (such as other MXA54's or a network hub). Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100-ohm Category 3, 4 or 5 cable for 10 Mbps connections or 100- ohm Category 5 cable for 100 Mbps connections. Please ensure that the cable length does not exceed 100 meters.

Pin assignment

When a network management cable (RJ-45 connector on each side) connects NMS PC and the MXA54 series directly, it should use a straight through cable. See Figure 4.1.2.

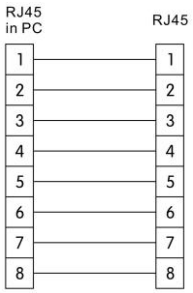


Figure 4.1.2 RJ-45 connector straight through connecting

PIN	Workstation port	MDI
1	Input receive data+	Output transmit data+
2	Input receive data-	Output transmit data-
3	Output transmit data+	Input receive data+
6	Output transmit data-	Input receive data-
4, 5, 7, 8	Nonuse	Nonuse

Table 4-1 RJ-45 Pin assignment

Straight				Cross			
(HA5400)		(Adapter)		(HA5400)		(HUB/ HA5400)	
1 IRD+	——	——	1 OTD+	1 IRD+	\	/	1 IRD+
2 IRD-	——	——	2 OTD-	2 IRD-	\	/	2 IRD-
3 OTD+	——	——	3 IRD+	3 OTD+	/	\	3 OTD+
6 OTD-	——	——	6 IRD-	6 OTD-	/	\	6 OTD-

Table 4-2 Straight and cross cable connecting

Port Connection

The MXA54 series can automatically detect the Ethernet cable type (Straight-through or Crossover), so either type may be used. An Ethernet twisted pair cable should be connected between the RJ-45 connector (MDI-X) of the MXA54 series and any device with a standard network interface (such as a workstation or server), or to a network interconnection device (such as a bridge or router).

1) Ensure that the device to be connected has a 10BASE-T or 100BASE-TX network interface card (NIC).

2) Prepare a twisted pair Ethernet cable with RJ-45 plugs on each end. Use Cat 3, 4 or 5 cable for standard 10Mbps Ethernet connections, or Cat 5 cable for 100Mbps Fast Ethernet connections.

3) Plug one end of the cable into the PC's NIC and plug the other end into any RJ-45 port of the MXA54 series. All the MXA54 RJ-45 ports support both 10Mbps and 100Mbps Ethernet connections. Ensure that the plug's locking tab clicks into proper position to make good connection.

Caution: Do not plug a phone jack connector into the RJ-45 port. This may damage the EDFA. Instead, use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

Note:

1) Connect other compatible MXA54 series or network hubs, use a direct or a cross cable to connect MDI port in other devices.

2) Ensure that the twisted pair cable length does not exceed 100 meters.

3) Cat 5 cable is recommended for all network connections to avoid confusion or inconvenience, when upgrading to Fast Ethernet devices in the future.

4) Cascade length provision: IEEE 802.3 standard prescribes that through twisted pair at most 4 hubs (such as repeaters) may be cascaded, and IEEE 802.3u standard has more strict order for high-speed Ethernet. So, when cascading devices except for this MXA54 series, please follow the above connection requirements.

Connection Management (Out-Band)

Remote management may be performed through the dedicated Management port (10/100BASE-TX port) on the front of the MXA54 or any 10/100BASE port of the MXA54.

Before the Management port is accessed through LAN port, please configure the IP address and subnet mask by serial port according to network configuration requirement.

RS232 Console port (DB9) Port Description

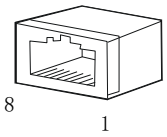


Figure 4-2.1 DB9 interface

DB9 interface is a standard connector used in RS232 in series communication connections. OLT adopts 9 pin standard connector which is same as the connector of PC Com interface.

Pin assignment

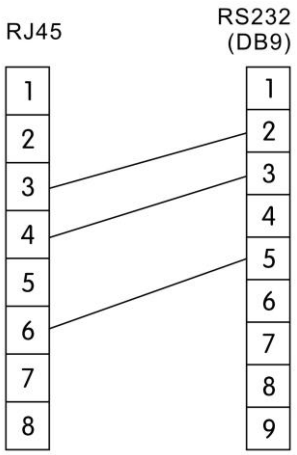


Figure 4-2.2 DB9/RS232 pin assignment

Pin	Distribution
2	RXD: accepting of data
3	TXD: transmitter data
5	SG: signal

Table 4-3 Pin information

FAULT DISPOSAL

The MXA54 series FTTP EDFA can monitor system operation and offer brief notices of warnings and can correct the majority of status deflections of the equipment, such as: system parameter floating, equipment tolerance, laser aging, level changes, and temperature changes. The PUMP laser will continue operating when alarming. The alarm will disappear if the facility is self-detecting continually or the relative system parameter recovers into normal range. Some serious warnings may be eliminated by restarting the power supply of the unit. The warning will disappear automatically if the relative parameters recover to normal range.

Most of warnings will be sent out when the correction ability is close to or exceeds the permitted range. For most situations, the user cannot modify the statuses.

Warning status

When the pump laser is in warning status, the status LED will turn red, and a brief note of the status will be displayed on the screen. The warning will not trigger the EDFA to stop operation, it will only show the relative parameter exceeding to normal scope. If the warning ends, it indicates that the relative parameter has returned into the permitted scope. The screen & LBD will return to their normal status and there is no need for the user to interfere. Note that we should emphasize that the problem displayed by the alarm should not be ignored, there may be a system fault.

Work status	Status display	LED color	Explanation
Present laser deflection is low	Key Off	Red	The EDFA is not operating. It is shut down.
Present case temp	-	Red	Warning when the temp ≥60°C.
Input	Input Low	Red	Optical input power is low.
Output	Output Low	Red	Optical output power is low.

Table 5-1 Warning status

Alarm status

When the pump laser displays a warning, it may typically stop operating. This may occur if an alarm exceeds a relative parameter for the safe operational scope, or some other potential situation has caused damage to the laser. The alarm may be eliminated by restarting the power supply or resetting the power. If the user is unable to eliminate the alarm, please contact Maxcom.

Fault prevention

Please read the below information to prevent potential problems.

1. Please place the pump laser within an environmental temperature of 32°F ~122°F (0°C ~50°C), and conditions that follow the required operating range. We suggest placing the EDFA in low dust environment.

3. Ensure the rear panel fan & front panel sockets have access to ventilation; ensure the rear panel fans are able to run flow without obstruction.
4. Ensure all power supply connections are solid.
5. Ensure input and gain are within the permitted range.

EDFA Model Number Ordering Matrix-North American Market

MXA-	5		4		□□		□ -		□ X		□□□ -		□□ -		□□		- □	
Product Series	Operating Wavelength		Production Type		Output Power (dBm) per port		Exterior		Number of Input Ports		Number of output ports		Output Port Connector type		Power Supply		Daisy Chain Ports +12 dBm ea.	
Model Series	5	1540-1563nm	4	NO WDM PON ports	17	17	A	1RU	1	Single Input (without switch)	004	4 ports	LA	LC/APC	11	100~240 VAC N. American Plug	D	4 Daisy Chain ports
					21	21	B	2RU	2	Dual Input (With Switch)	008	08 ports	SA	SC/APC	22	100~240 VAC European Plug	Blank	No Daisy Chain ports
					**	Custom dBm	C	3RU			016	66 ports			48	-48VDC		
					Available Output Power Range: +15 to +23 dBm						032	32 ports			42	1 each combo AC and DC		
											064	64 ports						

Please consult with your Maxcom Rep for ordering options,
*Note - Some options only available of certain chassis or models

*Notes:

Output Monitor port - Included
Adjustable Output feature - Included
Dual Hot Swappable Power Supplies - Included
SNMP - Web GUI access- Included

All units come standard with SC/APC connectors for **input, monitor, and daisy chain ports**.
Output ports come standard with SC/APC

877-330-5333

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