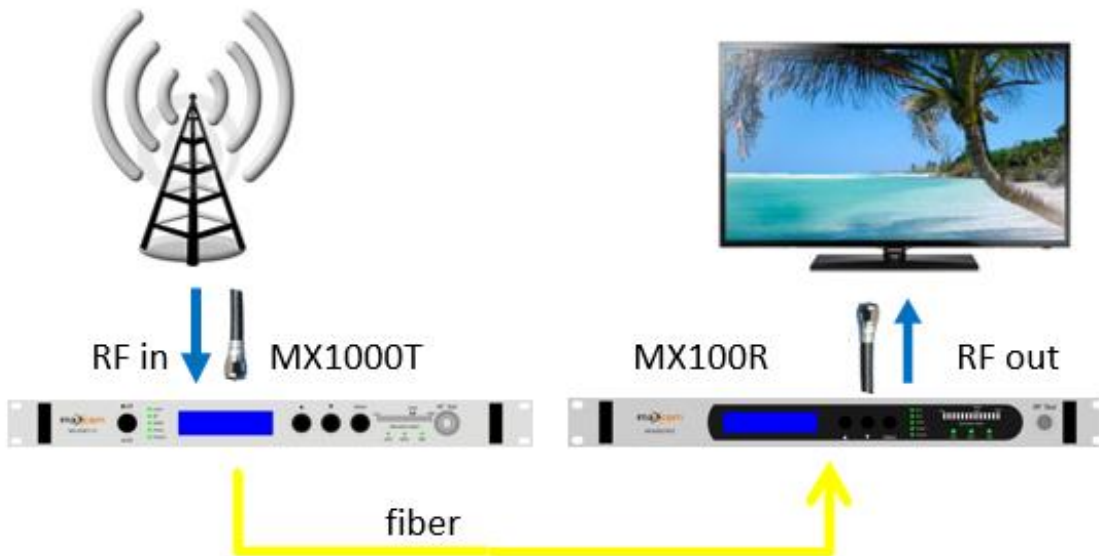




# 1310nm Direct Modulation Optical Transmitter · MX1000T Series

## USER MANUAL



# PRODUCT SUMMARY

## General Description

The MX1000T series direct modulated transmitter delivers high performance RF signal transmission of NTSC, PAL, digital or compressed digital information for CATV and/or telephony applications. It is based upon a custom high-linearity optically isolated DFB (Distributed Feedback) laser, specifically designed for multi-channel AM video applications. Automatic output power control coupled with temperature stabilization provided by a thermoelectric cooler ensures maximum performance and longer laser life.

The units are packaged in slim 1.75-inch high, 19-inch rack-mounted enclosures. Each unit is fitted with a self-contained Dual power supply with 110 VAC input.

ALL internal laser parameters and monitoring functions are by microprocessor control. The front panel LED displays select information related to the laser operation. Alarm relay contacts in the back of the units provide remote warning functions.

## Highlights

1. Transmits NTSC, PAL, QAM, digital, or compressed digital information for CATV.
2. High linearity, optically isolated, distributed AM feedback DFB laser.
3. 47-1000MHz RF input bandwidth Up to 158 NTSC channels
4. Front panel RF test point
5. Operation wavelength: 1310nm
6. Low RF drive levels required due to built-in RF amplifier
7. Microprocessor-controlled diagnostic testing with front panel and remote readout
8. Industry standards select monitoring interface RS-232



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## AMPLIFIER CONTROLS, INDICATORS, AND ALARMS

This section of the manual will give an overview of the available menus in the MX1000T series transmitter and their descriptions. All instructions in Section 2.0 refer to the representation of the front panel shown in the diagram below. The user scrolls through the menus using the push buttons found on the front panel, these are located just to the right of the LCD screen.



### Operation of the panel

#### Operation description

LED indicators are located next to the power on/off switch in the front panel. When green, unit is on and operating properly; Red indicates off or not operating. Blinking Red represents an alarm condition.

- A. Using 110V power supply, if the unit is operating properly, the digital panel will display "READY: KEY OFF", there will be a red light.
- B. To protect the laser, there is a time-delay function, after turning on with the key; the laser will begin operation after 10 seconds. The Indication light turns from Red to Green, the unit enters a self-diagnostic mode, after checking it enters working mode, display "**Descriptor**".

#### Start-up main menu

Press ▲\▼ button will display below menu in sequence.

##### **Menu # 1 - Descriptor**

Read-only menu, indicates the model of this equipment

##### **Menu # 2 - LD POWER**

Read-only menu, displays the optical output power in dBm

##### **Menu # 3 - LD BIAS**

Read-only menu, displays laser bias temperature in °C

##### **Menu # 4 - LD TEMP**

Read-only menu, displays the laser temperature in °C

##### **Menu # 5 - COOLING/HEATING**

Read-only menu, displays the amount of current that the Thermoelectric Cooler requires to maintain the laser temperature at nominal 25 °C

##### **Menu # 6 - UNIT TEMP**

Read-only menu, displays the system temperature



### **Menu # 7 - RF LVL**

Read-only menu, displays the RF input power level

### **Menu # 8 - RF MODE**

Current RF mode, displays AGC/Manual

In RF Mode = Select AGC or MGC

AGC = Automatic Gain Control

Manual = Manual Gain Control

### **Menu # 9 - +5V Reads**

Read-only menu, displays the voltage +5V

### **Menu # 10 - -5V Reads**

Read-only menu, displays the voltage -5V

### **Menu # 11 - +24V READS**

Read-only menu, displays the voltage +24V

### **Menu # 12 - IP**

Adjustable list, displays the IP address (optional)

### **Menu # 13 - S/N**

Read-only menu, displays the serial-number





## Menu assistant manual

1. The original RF Mode =AGC, the OMI menu displays RF Mode= ; at this time. If you press "SELECT", display RF Mode= ; Press "▲"or "▼", the menu display: RF Mode=Manual.
2. If display "INTERLOCK", and red blinking light, it may be the remote point at the back panel is loose.
3. If the RF input level is too high, there will be an alarm and red blinking indicator, shut down the power supply and turn on again.
4. +5V voltage (+5V READS)  $> \pm 0.5V$  alarm.  
-5V voltage (-5V READS)  $> \pm 0.5V$  alarm.
5. If a fault has occurred, there will be an alarm (Red blinking), Microprocessor will shut down the laser automatically, and digital panel will show the cause of the fault.

## PRODUCT FEATURE

1. Dual Module RF drive, high efficiency laser pre-distortion adjustment.
2. Full-automatically optical Modulation Intensity (OMI) control, AGC&MGC.  
Under AGC select, input range is 18dBmV~28dBmV, system index is optimum.  
Under MGC select, RF input range can be adjusted 15dBmV~30dBmV by the ATT on front panel.
3. Front panel has 20 lines OMI select display (Modulation Depth).  
Under AGC select, within RF range, OMI is always at NOM select.  
Under MGC select, OMI can be at NOM select by adjusting ATT.
4. Dual power supply built-in backup. Full-automatic switching.  
One is on and working, the other set to off as a cool backup (suggested).  
When both are on at the same time, one acts as hot backup. If one is damaged, switching to the other is fully automatic. Switch time $\leq 10\mu s$ .
5. Full-automatically control of casing temperature, ensures long life of the laser.  
Casing temperature is monitored and controlled by micro-processor. Display screen shows the actual operation temperature in time.  
When casing temperature $\geq 45^{\circ}C$ , two fans at the back panel will switch on automatically to cool it by constraint.  
When casing temperature $\leq 35^{\circ}C$ , the fans will shut down automatically to ensure longer life of the fans.

## CARRIER TO NOISE PERFORMANCE



(Example 79 ch NTSC, CTB=65dB, CSO=60dB)

Link loss (dB)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MX1000T-02	53	52.5	52.0	51.6	51.2	50.4	50.1									
MX1000T-04		53	52.6	52.2	51.8	51.4	51.1	50.5								
MX1000T-06					54.1	53.7	53.2	52.6	51.9	51.1						
MX1000T-08						54.5	54.0	53.0	52.5	52.0	51.0					
MX1000T-10							56.0	55.0	54.0	53.0	52.0	51.0				
MX1000T-12								55.8	55.0	54.2	53.4	52.6	51.0			
MX1000T-14									55.0	54.0	53.0	52.0	51.0	50.0		
MX1000T-16										54.4	53.6	52.8	52.0	51.2	50.4	
MX1000T-18											53.5	52.5	52.0	51.0	50.0	49.0

### 1.0 OPERATIONAL NOTICE

1. The unit should be properly grounded, grounding resistance <math>< 4\Omega</math>. 110V plug in adopts tri-wire rule, the middle wire is the grounding wire.
2. To make sure the reflected loss is  $\geq 45\text{dB}$ , use an SC/APC connector; other types (such as SC/UPC) are not matched. Keep the connector clean when installing. Clean it with degreased cotton with anhydrous alcohol after you have connected or reconnected the jumper after several (plug-in/out).
3. Do not turn on the unit separately or without the protection cover at the connector end. The laser may be harmful to the eyes or skin.
4. RF levels determine the OMI of the laser and the system index.(CNR, CTB, CSO). With NTSC analog carriers , the typical RF input level is 20dBmV. Suppose channel is N:  $S_i(N) = 20 + 10\text{Lg}(59/N)$  (dBmV)



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