

# QFRF FT13xxEG Optical Transmitter

## Transmitter Highlights

- Transmits NTSC, PAL, digital, or compressed digital information for CATV and/or telephony applications
- 1310nm operation
- Optically isolated cooled DFB laser diode with pre-distorter circuit
- 47-1000 MHz RF input bandwidth
- Up to 110 NTSC channels
- -20dB front panel RF test point
- Low RF drive levels required due to built-in RF amplifier
- Microprocessor-controlled diagnostic testing from front panel or optional remote monitoring
- Optional industry standard RS-232 status monitoring interface



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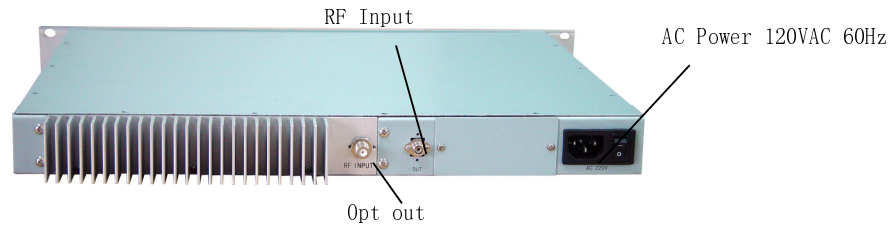
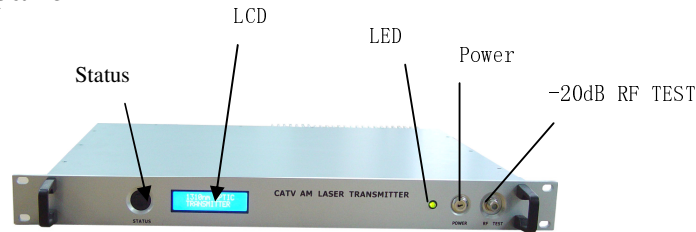
## General Station Description

The FT13xxEG AM laser transmitter delivers high performance signal transmission of NTSC, PAL, digital or compressed digital information for CATV and/or telephony applications. It is based upon custom high-linearity, optically isolated DFB (Distributed Feedback) lasers, which are specifically designed for multi-channel AM video applications. The unit also features a GaAs driver amplifier and predistorter circuit, which together provide exceptionally low noise and inter-modulation characteristics. 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 a standard 1RU enclosure, a slim 1.75 inch high and 19 inch wide rack-mount unit. Each transmitter is fitted with a self-contained UL-listed power supply with 85-254V AC input, 47-63 Hz for International use.

All internal laser parameters and monitoring functions are under microprocessor control: the front panel VFD displays status information related to laser operation. Optional alarm relay contacts in the back of the units provide remote warning in the case of a disabled transmitter.

## Front / back panel



## Operation description

A working status LED indicator is near the power supply keyswitch on the front panel. When it is green, the transmitter is working properly. Red indicates the laser output is disabled, and a Red Blinking LED indicates an alarm condition.

1. When AC power is first applied, the front digital panel should display “ READY : KEY OFF” , and the LED will be Red.
2. In order to protect the laser, there is a time-delay function built into the laser bias circuit. After turning the keyswitch ON, the laser will power up after 10 seconds, and the LED Indicator will turn from Red to Green.
3. At this time, the front panel VFD will display the transmitter model number, and the user can read out the related parameters by pressing the STATUS button, displayed on the digital screen (LCD) on the front panel:
  1. Model: FT13xxEG
  2. POWER (mW): Displays the optical output power in dBm
  3. TEMP: Displays the laser temperature in degrees C.
  4. BIAS (mA): Displays the laser bias current in mA.
  5. COOLING/HEATING (mA): Displays the amount of current that the Thermoelectric Cooler requires to maintain the laser temperature at 25 degrees C.
  6. READS the +5V DC supply voltage
  7. READS the +24V DC supply voltage
  8. READS the -5V DC supply voltage
4. If any faults listed above have occurred, there will be alarm (Red LED Blinking), the Micro-processor will shut down the laser automatically, and the digital panel will show the cause of the fault.
5. If the VFD displays the word “ INTERLOCK” , and the Red LED is blinking, this indicates that there is a bad connection to the optional remote interface on the back panel.
6. If the RF input level is too high, there will be an alarm and the Red LED will be blinking. After correcting the input level issue, turn off the rear power supply switch, and turn it back on again to reboot.

**Operation notice:**

1. The machine should have a good grounding source, with a grounding resistance < 4Ω . According to the international standard, the rear EIC-320 power connector adopts the tri-wire rule, where the middle wire is the grounding wire.
2. This transmitter features a UL-Listed, high efficiency, high reliability, well-regulated switching power supply, with overvoltage protection. It can work on any 110~254 VAC, 47-63 Hz electric network. The micro-processor is constantly monitoring the power supply’s output DC voltages. If the Fuse is blown, this indicates a problem with the transmitter’s internal circuitry, and it should be returned to QFRF for repairs.
3. In order to make sure that the optical output reflectivity is ≥50dB, this transmitter is only supplied with an SC / APC connector. Avoid touching the mating surface of the fiber jumper connector when installing it, and clean it using a greaseless cotton swab with anhydrous alcohol after several matings.
4. Do not turn on the transmitter without a protective cover on the fiber connector end. Laser radiation can do harm to the human body, especially the eyes.
5. The Input RF level determines the Optical Modulation Index (OMI) of the laser and the system performance (CNR, CTB, CSO). For 77 analog NTSC channels, the proper RF input level is typically 23dBmV. To calculate the proper input levels for other channel loads, use the following formula: Suppose the new channel number is N,

$$\text{New Input Level (dBmV)} = 23 + 10\text{Log}(77/N)$$

**Carrier to Noise Performance (dB)**

**(77 NTSC CHAN, CTB=67dB, CSO=63dB)**

Link loss(dB)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FT1302EG	53	52.5	52.0	51.6	51.2	50.4	50.1									
FT1304EG		53	52.6	52.2	51.8	51.4	51.1	50.5								
FT1306EG					54.1	53.7	53.2	52.6	51.9	51.1						
FT1308EG						54.5	54.0	53.0	52.5	52.0	51.0					
FT1310EG							56.0	55.0	54.0	53.0	52.0	51.0				
FT1312EG								55.8	55.0	54.2	53.4	52.6	51.0			
FT1314EG									55.0	54.0	53.0	52.0	51.0	50.0		
FT1316EG										54.4	53.6	52.8	52.0	51.2	50.4	
FT1318EG											53.5	52.5	52.0	51.0	50.0	49.0
FT1320EG												53.5	52.5	52.0	51.0	50.0
FT1322EG													52.9	52.4	51.4	50.4
FT1324EG														52.8	51.8	50.8
FT1328EG															52.4	51.4
FT1332EG																52.0

## Technical performance

Model	1302	1304	1306	1308	1310	1312	1314	1316	1318	1320	1322
Optic power (mW)	≥2	≥4	≥6	≥8	≥10	≥12	≥14	≥16	≥18	≥20	≥22
Optic power (dBm)	≥3	≥6	≥7.8	≥9	≥10	10.8	11.5	≥12	12.5	≥13	13.4
Link loss (dB)	4	7	8.8	10	11	11.8	12.5	13	13.5	14	14.4
Wavelength (nm)	+- 10nm			1310							
Connector				SC/APC							
Bandwidth (MHz)				45~1000							
Channel Loading				77 NTSC							
CNR (dB)				52							
CTB (dB)				-67							
CSO (dB)				-63							
RF input level (dBmV)	typical			23							
Flatness (dB)				±0.75							
Power consumption(W)				24							
Voltage (VAC)				85~254, 47-63 Hz							
Working Temp (°C)				0~45							
Size (mm)				483×385×44 (19 " ×15 " ×1.86 " )							