# FT10K
# 10 KW LDMOS FM POWER TRANSMITTER

The FT10K FM Transmitter is designed to provide more reliable high power FM transmitters using the LDMOS transistors for the FM broadcast market.
RGUI (Remote Graphical User Interface) system allows control, monitoring, fault analysis, and event logging using an I.P. based tool.
FT10K Transmitter has been designed to operate in the whole FM frequency range (87.5 to 108.0 MHz), able to deliver an output power adjustable from 0 to 10KW.
This unit is factory calibrated therefore it does not require any adjustment or calibration in place before starting its operation.
It consist of high efficiency latest generation LDMOS BLF574 transistors from NXP.
This LDMOS technology allows higher performance compared to the traditional MOSFET transistors:
- Higher efficiency.
- Higher gain (thanks to high transconductance value and low internal reaction capacitance of MOS transistors).
- Higher thermal stability (negative coefficient for drain current).
- Smaller dimensions at the same RF output power.

An output low pass filter guarantees a clean signal spectrum at any selected operating frequency.
In case of fault of the Transmitter or antenna system, a protection board lowers automatically the output power, in order to bring back the operating conditions to a safe area without causing a system shut down.
The protection board reduces the output power in case of:
- V.S.W.R. too high.
- Room temperature too high or cooling stops (OVER HEAT).

An automatic gain control circuit on the same board allows limiting the output power at an adjustable desired level (±1% tolerance)
The switch-mode power supply is largely oversized and guarantees a regular operation even in the presence of wide main voltage fluctuations: the switching converters contribute to obtain a very high AC to RF efficiency **(> 67%).**
A front panel meter combined with LED indicators enable the quick checking of the most important parameters of the equipment.
The system cooling is achieved by means of a heat sink and in order to guarantee a safe operation even in hard climatic conditions.

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**TECHNICAL SPECIFICATIONS**

**EXCITER SECTION (OM50)**

**RF Data**

| | |
|---|---|
| Power | 50 W adjustable from front panel |
| RF output impedance | 50 Ohm unbalanced, VSWR less than 1.5:1 |
| Frequency range | 87.5 to 108 MHz, |
| Frequency control | Synthesizer *processor controlled |
| Lock in Time | from starting to any programmed frequency: typically 4 sec. |
| Off lock attenuation | > 75 dBc (typical -80 dB) |
| Type of modulation | F3E / F8E direct FM at the carrier frequency |
| Modulation mode | Mono, Stereo, Multiplex, SCA, RDS, AUX (input selected by front panel) |
| Frequency deviation | ±75 kHz =100 %, ±150 kHz capability |
| Reference | TCXO = 12.8 MHz |
| Constancy of freq. dev. | ±1 % over six months. |
| Variation of frequency. | ≤ 1 kHz/year (internal TCXO) |
| Short term stability | ± 1 ppm from -5 to +45 °C, Can be synchronized by 1-2-2.5-5-10 MHz |
| Instantaneous BW | >20 MHz |
| RF harmonics | Exceeds EBU/CCIR/FCC requirements > -70dBc |
| RF spurious | Exceeds EBU/CCIR/FCC requirements < -100 dBc @ ± 1 MHz min. out of carrier (typical -110 dB) |
| Pre-emphasis | Flat/50/75µs selectable via front panel |
| Pre-emphasis precision | Nominal 1% (typical 0.4%) |
| Stereo operation | CCIR 450/S2 "pilot tone system" |

**AUDIO CHARACTERISTICS**

| | |
|---|---|
| Audio response | 0.15 dB da 20 Hz to 15 kHz (+0/-2%) |
| Audio filter attenuation | 55 dB @ 19 kHz, > 45dB 19 to 100 kHz |
| Common mode rejection | 20 Hz to 15 kHz 45 dB |
| Stereo Separation | 30-80Hz >53dB (typ. 56), 80Hz-15kHz >60 dB (typ.70) |
| Crosstalk attenuation (M / S) | 40 dB 30 Hz to 15 kHz (typ. 55dB / 100Hz to 8 kHz) |
| Spurious products | 53 kHz > 50 dB |
| 38 kHz suppression | 70 dB (Typ. -85dB) |
| Subcarrier frequency | 38 kHz ±2 Hz |
| Subcarrier generation | internal crystal |
| Pilot frequency | 19 ± 1 Hz |
| Phase difference | 19/38 kHz 0°±2° adjustable |
| THD+N on encoded channels | 0.03 % 30 Hz TO 15 kHz (typ. -74dB) |
| IMD | Measured with a 1 KHz and 1.3 KHz tones, 1:1ratio, at FM 75 kHz |
| | 0.03 % Typ. IMD D2 < -83 dB D3 < -88 dB |
| TIM (DIM30) | 0.03 % (square/sinus) Typ. < -77 dB |
| Nominal pilot deviation | ±7 kHz |
| Audio Inputs | L, R, Composite, SCA, RDS, Aux |
| Input Levels | -3 to +9 dBm / (L&R) |
| | -3 to +6 dBm / (Others) |
| Bandwidth | 30 Hz – 15 kHz 0.1 dB (L&R%Composite Channels) |
| | 40-100 kHz 0.15 dB SCA/RDS/Aux Channels |

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**AMPLIFIER SECTION (FA10K)**

**RF Data**

| | |
|---|---|
| Operating Frequency | 87.5-108.0 MHz |
| RF Power Input | 50W |
| RF Power Output | 10,000W |
| RF Input Connector | N |
| RF Output Connector | EIA 1-5/8 |
| In/Out Impedances | 50 Ω |
| RF Probe | -40 dB, 50 Ω, BNC |
| Power Stability | < 1% |
| Overall Efficiency | 67% |
| Spurious and harmonic suppression (ref. to carrier) | < - 80 dBc |
| Synchronous AM (ref. 100% mod.) | < - 58 dB |
| Asynchronous AM (ref. 100% mod.) | < - 50 dB |

**Measured Values**

Forward power
Reflected power
DC supply voltage of each RF stage
DC supply current of each RF stage
Heat sink Temperature
Environmental Temperature
AC Mains voltages

**Environmental**

| | |
|---|---|
| Cooling | forced air by internal fans |
| Service | continuous 7/24 h |
| Operating temperature | 15 to +45 °C/ 5 to +104 °F |
| Max. Installation altitude | 4000m on sea levels |

**Power**

| | |
|---|---|
| AC Voltage | 3 Ph. 320/450VAC – 47-63 Hz |
| Power Consumption | 15000VA |

**Physical Features**

| | |
|---|---|
| Height | 33U (147 cm) |
| Width | 60 cm Rack Mountable. |
| Depth | 110 cm deep including connectors. |
| Weight | 260 kg. |

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