

FM1

1 kW FM Transmitter



FM1 Transmitter

QUICK SPECS

- Compact 19" 3U rack mount size
- Lightweight: only 53 lb/ 24 kg
- Frequency-agile
- Automatic power reduction into >1.9:1VSWR
- Open and short circuit protected
- HD Radio™ setting incorporated
- Switch mode power supply with wide AC input range and high power factor
- Front panel-accessible output power adjustment
- Built-in automatic level control
- Metering of FWD and RFLD power, PA volts and current, and heatsink temperature
- Status LEDs for CPU status, PA current limit, temp limit, and FWD and RFLD power limits
- Remote monitoring and PWR trim control
- RF monitor output
- FM2 2 kW FM transmitter also available

GREAT THINGS REALLY DO COME IN SMALL PACKAGES

TRANSMITTER

The FM1 is a compact, frequency-agile, totally solid state 1 kW FM transmitter. The FM1's broadband capabilities, reliable performance and compact size make it the ideal choice for main or standby operation. The lightweight design incorporates a 3U, 19" rack mount size that allows for convenient one-person installation almost anywhere saving valuable transmitter site space. Robust broadband amplifiers, a wide AC voltage range, and reliable VSWR protection ensure secure on-air operation.

RF AMPLIFIER

Four wideband amplifier pallets featuring individual push-pull FET configurations run conservatively at 250 watts output each. Amplifier pallets are mounted on an aluminum extruded heatsink, which is continuously cooled by two 119 mm, 50 V DC fans. A precision semiconductor sensor located centrally between the amplifier pallets measures heatsink temperature. The RF output is split to

drive the four amplifier pallets in parallel utilizing a quarter wave matching section.

COMBINER

The four amplifier pallets, each with associated output low pass filters, are combined using a four-to-one Wilkinson isolating combiner to produce 1 kW output power into 50 ohms. The isolating combiner uses high power balancing resistors to allow continuous operation under a PA failure condition. The combiner output is routed through a VSWR detector to the output connector.



Making Digital Radio Work.



POWER SUPPLY

The FM1 uses a proprietary switch mode power supply rated for 2.8 kW at 50 V DC output and can operate over an input range of 176 V AC to 260 V AC. The power supply feeds the four amplifier pallets via high current fuses, accessible from the FM1's rear panel. A 12 V supply is also derived via a low current supply fuse from the 50 V line to power the amplifier control circuitry and bias supply.

FRONT PANEL MONITORING

FM1 indications are provided by an analog front panel meter and status LEDs. Meter indications show forward and reflected power, PSU voltage and current, and heatsink temperature. Five tri-color LEDs show CPU status, PA current limit, temperature limit, and forward and reflected power limits. Status information is derived from a micro-controller monitor and ALC voltages.

CONTROL CIRCUIT

In analog mode, the transmitter output level and response to load and temperature variations are controlled at the amplifier control board. Feedback signals for temperature, forward and reverse power and supply current levels are summed into an analog feedback loop, allowing for bias voltage control. The single bias output is split and routed to the four amplifier pallets, providing automatic level control (ALC), as well as VSWR foldback control. RF output power level can be set by a potentiometer accessible from the FM1's front panel. Additional fast shut down under fault conditions is provided by a comparator circuit (2-3 milliseconds response) with MPU backup.

HD RADIO

The FM1 can be quickly converted to a transmitter compatible with HD Radio™ and capable of producing up to 150 watts average of all-digital power.

MECHANICAL DETAIL

The anodized and welded steel case is constructed with a separate front panel two-part assembly, allowing access for optional air filters and rack handles. Convenient mounting in a standard 19" rack is possible using the optional rack mounting support bracket.



FM1 in rack



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