

FMi 21T - Technical Specifications : Technical Specifications

RF SPECS (FM+HD)

Output Power:**Maximum:**

21kW (-20 dB HD signal injection ratio)

Exciter:

Broadcast Electronics FXi 60 digital FM/HD exciter

PA Efficiency:

67% or better at rated power

Overall AC Efficiency:

57% or better at rated power

Frequency:**Range:**

87.5MHz to 108MHz; programmable in 10kHz steps

Stability:

+/- 150Hz, -10°C to +50°C using high accuracy internal oscillator. 10MHz and 1pps input for synchronization to external (GPS) reference. Automatic switching to internal oscillator if external reference fails.

VSWR:

Rated power into 1.8:1 VSWR, capable of operating into higher VSWR with automatic power reduction; Protected against open and short circuit, all phase angles

RF Harmonics Suppression:

Internal harmonic filter meets or exceeds all FCC, IC, CE, CCIR and IEC215 requirements. Meets or exceeds standard NRSC-5A emission limits in all operating modes

Modulation Type:

FM digitally synthesized direct to channel, HD digital direct to channel, FM + HD Radio digital direct to channel.

Operation Modes:

FM + HD Radio or FM Only.

FM Modulation Capability:

Greater than +/-300 kHz

Asynchronous AM S/N Ratio:

55dB minimum below equivalent 100% amplitude modulation by 400Hz using 75us de-emphasis (no FM modulation present). 65dB typical below equivalent 100% amplitude modulation by 400Hz using 75us de-emphasis (no FM modulation present).

Impedance:

50 ohm

Regulatory:

Meets or exceeds all FCC requirements

AUDIO SPECIFICATIONS WITH FXI 60 DIGITAL EXCITER

Modes:

Stereo, mono (L+R), L only, R only; remote selectable

Stereo Performance (AES or analog inputs):**Pre-Emphasis:**

Selectable None, 50 or 75 microseconds

Stereo Pilot Tone:

19kHz \pm 0.03Hz; injection level adjustable 0% to 15% in 0.1% steps; Nominal: 9%; Suppression: 38kHz, 57kHz, 76kHz, and 95kHz; 80dB below \pm 75kHz deviation.

Stereo Separation:

65dB or better, 20 to 15kHz

Dynamic Stereo Separation:

65dB or better, 20 to 15kHz

Broadcast Electronics

Technical Specifications

Amplitude Response:

0.1dB, 20Hz to 15kHz

Signal to Noise Ratio:

87dB or better below 100% modulation at 400Hz; measured in a 20Hz to 22kHz bandwidth with 75us de-emphasis and DIN "A" weighting.

Total Harmonic Distortion:

<.03%; 20Hz to 15kHz, in bandwidth 20Hz to 22kHz; with 75us de-emphasis.

Intermodulation Distortion:**CCIF:**

<.03% or less (14/15kHz 1:1)

SMPTE:

<.03%(60 and 7kHz 1:1)

Transient Intermodulation Dist:

<.03%; (2.96kHz square wave/14kHz sinewave modulation).

Linear Crosstalk:

90 dB below 100% modulation reference

Non-Linear Crosstalk:

80 dB below 100% modulation reference

Audio Overshoot:

<.2dB

Mono Performance (AES or analog input):**Pre-Emphasis:**

Selectable None, 50 or 75 microseconds

FM Signal to Noise Ratio:

95dB or better below 100% modulation at 400Hz; measured in a 20Hz to 22kHz bandwidth with 75us de-emphasis and DIN "A" weighting.

Amplitude Response:

±.1dB, referenced to selected pre-emphasis curve

Intermodulation Distortion:**CCIF:**

.03% or less (14/15kHz 1:1)

SMPTE:

.03% or less (60/7kHz 1:1).

Transient Intermodulation Dist:

.03% or less (2.96kHz square wave/14kHz sine wave).

Composite Analog Input:**FM Signal to Noise Ratio:**

95dB or better below 100% modulation at 400Hz; measured in a 20Hz to 22kHz bandwidth with 75us de-emphasis and DIN "A" weighting.

Amplitude Response:

±.01dB, 20Hz to 53kHz; ±.1dB, 53kHz to 100kHz.

Total Harmonic Distortion:

.005% or less over stereo sub band (10Hz to 53kHz) with 75us de-emphasis.

Intermodulation Distortion:**CCIF:**

.005% or less (14/15kHz 1:1)

SMPTE:

.005% or less (60/7kHz 1:1)

Transient Intermodulation Dist:

.005% or less (2.96kHz square wave/14kHz sine wave).

Slew Rate:

11.8V/us-symmetrical.

Phase Response Variation:

±.05° from linear phase, 10Hz to 100kHz.

Group Delay Variation:

±5ns, 22Hz to 53kHz, ±30ns, 53kHz to 100kHz



Broadcast Electronics

Technical Specifications

External SCA, RBDS Performance:

SCA Format:

Externally generated, analog FM subcarriers in the range 53-99kHz

SCA Sub-band Amplitude Response:

± 0.5 dB; 40kHz to 100kHz

SCA Channel FM Signal to Noise Ratio:

80dB below +6kHz subcarrier deviation at 400Hz with 150us de-emphasis.

Harmonic Distortion:

Less than .2% in audio pass-band of SCA generator

Intermodulation Distortion:

SMPTE(60 and 7kHz, 1:1): 0.2% or less, no pre/de-emphasis, SCA generator low-pass filter bypassed.

Crosstalk:

SCA to Stereo:

80dB below 100% modulation, L or R channel with 75us de-emphasis.

Stereo to SCA:

80dB below 100% modulation referenced to ± 6 kHz deviation and 150us de-emphasis.

SCA to SCA:

80dB below 100% modulation referenced to ± 6 kHz deviation and 150us de-emphasis per channel

Dual Internal SCA Performance:

Pre-Emphasis:

Selectable: 150us, 75us, 50us, none.

Amplitude Response:

± 0.5 dB; 20Hz to 7kHz.

Subcarrier Frequency:

57kHz to 99kHz.

Signal to Noise Ratio:

80dB with de-emphasis(150us)

Total Harmonic Distortion:

.1% 10Hz to 5kHz

SCA Deviation Capability:

1kHz to 10 kHz; software programmable.

Injection Level:

2% to 15%, software adjustable in 0.1% increments

Spurious & Harmonic:

2nd Harmonic:

Better than 40dB below subcarrier

3rd Harmonic:

Better than 45dB below subcarrier

All other components:

50Hz to 100kHz: better than 80dB below subcarrier.

RBDS Generator (Internal):

Subcarrier Frequency:

57kHz, ± 0.1 Hz.

Injection Level:

2% to 15%, software adjustable.

MECHANICAL/PHYSICAL

Size/Unpacked:

PA/Driver Cabinet:

56.6" W x 31.5" D x 70" H (143.5 W x 80 D x 177.8 H cm)

Power Supply:

34.5" W x 31.5" D x 70" H (87.6 W x 80 D x 177.8 H cm)



Broadcast Electronics

Technical Specifications

Weight/Unpacked:**Transmitter:**

1500 lbs. (682 Kg)

Power Supply:

1750 lbs. (749 Kg)

Cooling Air Requirements:**PA Cabinet:**

1500 CFM

Driver Cabinet:

500 CFM

High Voltage Power Supply:

natural convection

Air Outlet:

Air exhaust at top of cabinet

Primary:

Top of Power Amplifier Cabinet (33" X 30")

Secondary:

Top of Driver (22" X 30"), Power Supply Cabinet (33" X 30")

Heat Dissipation:**Typical:**

17 kW (58,021 BTU/hr) @ 21 kW RF output

Maximum:

21 kW (71,673 BTU/hr) @ 21 kW RF output

Air Conditioning Sizing:

6 ton

RF Output Connector:

3-1/8" EIA flange

ENVIRONMENTAL**Ambient Temperature Range:**

+32°F to +122°F (0°C to 50°C)

Altitude:

7500 ft. (2286 M) @ 50 Hz; 10,000 ft. (3048 M) @ 60 Hz

Humidity:

0% to 95% Non-Condensing

ELECTRICAL**AC Input Voltage:****3-Phase Closed Delta:**

240 VAC (196-252 VAC), 50/60 Hz

3-Phase WYE 3 Wire:

240 VAC (196-252 VAC), 50/60 Hz

3-Phase WYE 4 Wire:

400 VAC (339-437 VAC), 50/60 Hz

Disconnect Size:

250 A per phase, fused disconnect recommended

AC Wire Size:

300 KCMIL copper, THHN or equivalent

Current Draw @ 21 kW:

123 A per phase average (actual determined by line voltage, carrier frequency, etc.)



Broadcast Electronics

Technical Specifications

AC Power Consumption:

Typical @ 21 kW RF Output Power:

38 kW

Maximum @ 21kW RF Output Power:

42 kW

Power Factor:

0.94 or better at full load

Surge Protection:

External surge suppressor (supplied by customer)

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

