

GENERAL

Transmitter Type

Medium wave, AM, 100% solid state

Configuration

160 RF power modules, each including a single integrated RF amplifier/modulator

No frequency dependant parts in RF module

Each module is hot pluggable and has internal microcontroller for protection and monitoring over a serial bus

Short circuit protection at the module level offers an added layer of protection

Dual redundant digital single board exciters utilizing FPGA/DSP technology with automatic changeover

Pre-correction utilized specifically to improve digital performance

Redundant low voltage power supplies

RF Output Power

Continuous Average: 600 kW

Peak Capability: 2200 kW

AM Carrier: 0 to 440 kW (adjustable)

Up to 62 preset levels, presets may include other operational parameters such as DRM vs Analog and different program inputs

Output level stabilized against AC supply voltage variations

Built in Dynamic Carrier Control

Built in AM stereo

RF Output Connection

6 1/8 EIA female standard, other outputs on request

RF Output Impedance

50 ohms, unbalanced

Efficiency

90% typical at 400 kW

RF Load VSWR

64000 peak reflected watts (1.5:1 VSWR @ 400 kW, 100% modulation) results in instantaneous power shutback

16000 average reflected watts (1.5:1 VSWR @ 400 kW, 0% modulation) results in a graceful power reduction

Frequency Range

531 kHz to 1,620 kHz.

"Quick frequency change capability"

Frequency Stability

±2 ppm over temperature range

Optional 300 ppb ovenized source with GPS option

Modulation Type

6 phase direct digital modulation

1.8 MHz modulation sample rate

Modulation Capability

135% positive peak modulation to 400 kW

120% positive peak modulation to 440 kW

Spurious and Harmonic

Meets ITU-R SM.328-10

Meets ITU-R SM.329-9

AC INPUT

Voltage

340 V to 440 V, 3 phase or to customer specifications

Power Supply Variation

±10% voltage, 47 Hz to 63 Hz

Power Consumption

444 kW typical at 400 kW, 0% modulation

666 kW typical at 400 kW,

100% modulation

Cos (theta)

0.95 typical @ nominal line voltage

ENVIRONMENTAL

Temperature Range

0°C to + 50°C

Derate 3°C per 500 m above sea level (2°C per 1,000 ft)

Humidity Range

0% to 95% non-condensing

Altitude

0 m to 4,000 m (0 ft to 13,000 ft)

Cooling Air Requirements

10,200 m³/hr (6000 CFM)

SAFETY

Meets EN60215: 1996 Safety Requirements for Radio Transmitting Equipment



PHYSICAL

Dimensions

Transmitter Cabinet

184.2* cm H x 383 cm W x 120 cm D

(72.4" H x 150.8" W x 47.2" D)

*not including antenna grounding switch

External Transformer Cabinet

203.2 cm H x 185.4 cm W x 114.3 cm D

(80" H x 73" W x 45" D)

Weight

Main transmitter cabinet with modules installed:

2268 kg (5000 lbs)

Power transformer:

2000 kg (4400 lbs)

AUDIO PERFORMANCE

Analog Broadcast Inputs

Dual AES-EBU Digital Audio inputs* adjustable from -30dBFS to 0dBFS for 100% modulation

600 ohms balanced analog audio input +10 dBm nominal for 100% modulation, adjustable from -10 to +12 dBm

Digital Broadcasting Inputs

I,Q over AES-EBU, SRC available* with sample rate converter

I,Q over LVDS, 3 pairs, Clock, Data, frame sync

*Two AES-EBU inputs provided and may be used for either analog audio or digital I,Q inputs

Optional DRM Generator/Content Server

Optional Embedded HD Radio Generator (Exgine™)

Frequency Response

+0.2 dB/-0.8 dB, 30 Hz to 10,000 Hz.

Optional audio input filters available to meet regional bandwidth restrictions

Total Harmonic Distortion

Better than 0.8% (THD), 30 Hz to 10,000 Hz at 95% modulation (typical)

Intermodulation Distortion

SMPTE 1:1 Ratio, 60Hz/7kHz, 95% Mod Peak - 0.5% @ 400kW (typical)

DIM-B, 2.96kHz/9kHz, 80% Mod Peak - 0.5% @ 400kW

Carrier Shift

0.5% or less

Hum and Noise

-65 dB or better below 400kW,

100% modulation

CONTROL AND MONITORING

Extensive Control/Monitoring/Troubleshooting system through 17" front panel LCD touchscreen. Touch panel control system is non-critical and may be removed from the system without affecting transmitter operation or remote control/monitor via direct wired connections. Redundant back-up control interface provides control in case of front panel computer system failure. Built in instrumentation providing detailed spectrum/impedance and modulation analysis.

Metering

Cube

DC Voltages (B+, PA and 15V)

DC Current

Sample Levels (PDM and RF Drive)

Fan Speeds

Heat Sink Temperature

Rack

DC Voltage levels (15V, 5V, 30V, 48V and B+)

Rectifier Fan Speeds

DC Current

Rectifier Heat Sink Temperature

AC Voltage

Exciter

Output Current (RMS, Peak, Carrier)

Output Voltage (RMS, Peak, Carrier)

Forward Power (RMS, Peak, Carrier)

Reflected Power (RMS, Peak, Carrier)

Audio/Modulation Levels (RMS and Peak - Positive/Negative)

Load Impedance

Controller

PDM and RF Drive Levels

Ambient Temp

RF Monitor

RF monitor is a power sample (using a directional coupler) that will allow for accurate audio performance measurements

Status

Easy access to current transmitter operating state, past and present alarm conditions and historical trends of both digital and analog channels

Schedule

Intuitive easy to read built in scheduler

Up to 144 yearly rules can be defined by user

Remote Control/ Monitoring

Three Remote interfaces:

- Direct wired optically isolated inputs and open collector outputs
- Web interface - All locally available control is available over TCP/IP web interface
- SNMPv1

COMPLIANCE

Product complies with:

- ISED specification BETS-5 issue 1
- FCC CFR title 47 part 2 and part 73
- Conforms with all essential requirements of Radio European Directive 2014/53/EU

Notes:

Specifications defined in a laboratory environment with high grade source and demodulation equipment. Standard factory measurements does not include all items.

