

VHF AIR TRAFFIC CONTROL RADIOS

EM 9000-2G TRANSMITTER

- 50W RF output power,
- Low power consumption,
- High reliability,
- Outstanding ACP performance,
- Built-in-test.



RE 9000-2G RECEIVER

- Outstanding sensitivity and costing, performance,
- High reliability,
- Built-in-test.

OVERVIEW

The TELERAD Series 9000 - 2G radio systems are specifically design to meet the operational requirements of air traffic control centers, commercial airports, and range installations. Fully scalable and with growth capacity, it features high reliability, and remote control and maintenance capability.

SYSTEM FEATURES

- Multimode functionality in one Software Defined Radio
- AM, ACARS, upgradable VDL Mode 2 (Provisions for Mode 3 and Mode 4)
- Wide band 118 - 144 MHz, with option to extend to 108-150 MHz
- 5 - 50 W RF Output Power
- Remote control and maintenance capability, Built-in test
- SNMP, 2 Ethernet ports
- Provisions for VoIP

GENERAL DATA

- **Frequency range:**
 - 118.000-144.000 MHz
 - 108-150 MHz in option
- **Frequency stability:**
 - ≤ 1 ppm
- **Channel spacing:**
 - 25 kHz, 8.33 kHz
- **Modulation:**
 - A3E (Voice)
 - AM-MSK (ACARS)
 - D8PSK 10500 symbols/s (VDL2)
- **Power supply:**
 - DC power supply:
 - 24 V DC (21-31 V)
 - AC power supply (optional):
 - Primary power: 230/115V AC
 - Secondary power: 24 V DC (21-31 V)
 - Automatic switchover AC-to-DC
- **Temperature:**
 - Operating: -20°C to +55°C
 - Relative humidity: 95% at 40°C (non-condensing)
 - Storage: -40°C to +80°C
- **Data interface:**
 - RS485 up to 115.2 Kbps
- **Maintenance:**
 - Local (RS232) or remote (RS485)
 - Maintenance: BIT, software loading
 - Setup functions: frequency, operation, parameters
 - Measurements: Tx output power, VSWR, DC voltage, Rx AGC voltage...
- **IP technology:**
 - SNMP
 - 2 Ethernet ports
- **Standards:**
 - ICAO SARPS
 - ETSI EN 300 676: AM
 - ETSI EN 301 841 - 1: VDL2
 - ETSI EN 301 489 (-1/-22)

EM 9000 - 2G TRANSMITTER

- **Mechanical characteristics:**
 - Width: 19 in (483 mm)
 - Overall depth: 17 in (430 mm)
 - Height: 5.2 in (132 mm), 3U
 - Weight: < 31 lbs (14 kg)
- **Power consumption (50W AM - 1kHz 80%):**
 - 24V DC: 14 A (Typ.)
 - 230V AC: 2.2 A (Typ.)
 - 115 Vac: 3.9 A (typ.)
- **Carrier Offset (ICAO Annex 10):**
 - Up to 4 in 25 kHz channels (5 in option)
 - 2 in 8.33 kHz channels
- **RF output power:**
 - 5-50W in 0.5 dB steps
- **VSWR:**
 - Up to a VSWR of 2:1 without power reduction
- **Protections:**
 - Power reduction on overheating, low voltage and high VSWR
- **Duty cycle:**
 - 100% (with external fan)
- **AM Voice (A3E):**
 - Modulation rate > 85%
 - THD: <3% (m=85%)
 - Max line input level: +10 dBm
 - Line input impedance: 600 ohms
 - AFC AGC regulation: <0.5 dB for 30 dB
- **AM and Data Responses:**
 - A3E AM Voice at 25 kHz channel spacing: >-3 dB 300-3400 Hz, <-40 dB @ 5000 Hz
 - A3E AM Voice at 8.33 kHz channel spacing: >-3 dB 300-2500 Hz, <-40 dB @ 3200 Hz
 - ACARS: > -3 dB 200-3400 Hz
- **Tx Time Out:**
 - Adjustable from 1 to 5 min (can be disabled)
- **Spectral purity:**
 - Harmonics: <-36 dBm (<-83 dBc)
 - Spurious: <-54 dBm (<-101 dBc)
 - Noise at 1% of Fo: <-150 dBc/Hz
- **Adjacent channel power:**
 - AM 8.33 and 25 kHz: <-70 dBc
 - D8PSK:
 - 1st channel: <-18 dBm (16 kHz)
 - 2nd channel: <-28 dBm (25 kHz)
 - 4th channel: <-38 dBm (25 kHz)

RE 9000 - 2G RECEIVER

- **Mechanical characteristics:**
 - Width: 19 in (483 mm)
 - Overall depth: 17 in (430 mm)
 - Height: 1.75 in (44.5 mm), 1U
 - Weight: < 9 lbs (< 4 kg)
- **Power consumption (receiving):**
 - 24V DC: 500 mA (Typ.)
 - 230V AC: 180 mA (Typ.)
 - 115V AC: 270 mA (Typ.)
- **Sensitivity:**
 - A3E: ≤ -105 dBm (SINAD 12dB, 1kHz 30%)
 - ACARS: -102 Bm (>99% of messages)
 - Mode 2: -98 dBm (BER<10⁻³ w/o FEC)
- **Distortion (1 kHz, 90%):**
 - ≤ 5%
- **AF Bandwidth:**
 - A3E AM Voice at 25 kHz channel spacing: ≥ 300-3400 Hz
 - A3E AM Voice at 8.33 kHz channel spacing: ≥ 300-2500 Hz
- **AF Noise (-13 dBm, 1 kHz, 90%):**
 - > 50 dB
- **Effective Bandwidth @6dB:**
 - In 25 kHz: >± 8.5 kHz
 - In 8.33 kHz: > ± 2.8 kHz
- **Adjacent channel rejection:**
 - ≥ 70 dB
- **Spurious rejection:**
 - ≥ 70 dB
- **3rd order Intermodulation (SINAD 12 dB, 100 kHz and 200 kHz):**
 - ≥ 80 dB
- **Desensitization:**
 - ≥ 100 dB
- **Cross Modulation:**
 - ≥ 85 dB
- **AGC Response (A3E Voice):**
 - Dynamic range: 100 dB (Variation ≤ 3 dB)
 - Attack time: <50 ms
 - Release time: <50 ms
- **Audio Line Output:**
 - Adjustable from -11 to +10 dBm in 1 dB step
 - Impedance: 600 ohms
- **Squelch:**
 - Attenuation: ≥ 60 dB
 - Type: Carrier, Spurious Canceller

Data subject to change