

TELERAD

Aeronautical and Maritime Radiocommunication Systems

UHF SOFTWARE DEFINED RADIOS

TRX9010-2G



■ TRANSMISSION

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



■ RECEPTION

- Outstanding sensitivity and cositing performances
- High reliability
- Built-in-test

■ OVERVIEW

The TELERAD Series 9010-2G radio systems are specifically designed to meet the operational requirements of military air traffic control centers.

Fully scalable and with growth capacity, they feature high reliability, and remote control and maintenance capability.

■ MAIN FEATURES

- Multimode functionality in one Software Defined Radio
- A3E, F3E, upgradable UDL (D8PSK, 31500 bits/s)
- Wide band 225-400 MHz,
- Embedded Main/Standby redundancy function
- 5 to 50 W RF Output Power
- Remote control and maintenance capability, Built-in test
- SNMP, JBUS
- VoIP conform to EUROCAE ED-137
- 4 Ethernet ports for redundancy
- Built-in automatic cavity filter in option

■ GENERAL DATA

Frequency range:

225-400 MHz

Frequency stability:

≤ 0.3 ppm

Channel spacing:

25 kHz, 12.5 kHz and 8.33 kHz

Modulation:

- A3E / F3E (voice)
- D8PSK 31500 symbols/s (UDL provision)

Data interface:

RS485 up to 115.2 Kbps

Maintenance:

- Local (RS232) or remote (RS485)
- Maintenance: Built-in test, software loading
- Setup functions: frequency, operation, parameters
- Measurements: Tx output power, VSWR, DC voltage, Rx AGC voltage, ...

Temperature:

- Operating: -20 °C to +55 °C
- Relative humidity: 95 % at +40 °C (non-condensing)
- Storage: -40 °C to +80 °C

Power supply:

- AC: 85-265 V, 50-60 Hz
- DC: 28 V_{DC} (21-31 V_{DC})
- Automatic switching from AC to DC input

IP technology:

- VoIP (according to ED-137-1)
- SNMP V1, V2c, V3 (according to ED-137-4)
- 4 Ethernet ports IPv4, IPv6

Standards:

- ICAO SARPS
- ETSI EN 302 617: AM
- ETSI EN 301 489 (-1/-22)
- EUROCAE ED-137: VoIP

Mechanical characteristics:

- Width: 483 mm
- Overall depth: 490 mm
- Height: 132 mm, 3 U
- Weight: < 14 kg

■ TRANSMISSION

Power consumption (50 W AM - 1 kHz 80 %):

- 28V_{DC}: 14 A (Typ.)
- 230V_{AC}: 2.2 A (Typ.)
- 115 V_{AC}: 3.9 A (typ.)

Carrier Offset (ICAO Annex 10):

25 kHz channels: up to 4 carriers

RF output power:

5-50 W 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)

A3E modulation:

- Modulation rate > 85 %
- Harmonic distortion: < 3 % (m = 85 %)
- Audio input adjustable from -30 to 0 dBm (max. +10 dBm)
- Audio input impedance: 600 Ω
- AF AGC regulation: < 0.5 dB for +30 dB
- Audio bandwidth at 25 kHz channel spacing: > -3 dB 300-3400 Hz, < -30 dB at 5000 Hz
- Audio bandwidth at 12.5 kHz channel spacing: > -3 dB 300-2500 Hz, < -30 dB at 3200 Hz
- Audio bandwidth at 8.33 kHz channel spacing: > -3 dB 300-2500 Hz, < -30 dB at 3200 Hz

Tx Time Out:

Adjustable from 5 to 300 s in 5 s steps (can be disabled)

Spectral purity:

- Harmonics: < -80 dBc
- Spurious: < -80 dBc
- Noise at 1 % of the carrier: < -150 dBc/Hz

Adjacent channel power (ACP):

AM 8.33 and 25 kHz: < -70 dBc

- D8PSK: 1st channel: < -18dBm (16 kHz)
- D8PSK: 2nd channel: < -28dBm (25 kHz)
- D8PSK: 4th channel: < -38dBm (25 kHz)

■ RECEPTION

Power consumption (receiving):

- 28 V_{DC}: 500 mA (Typ.)
- 230V_{AC}: 180 mA (Typ.)
- 115V_{AC}: 270 mA (Typ.)

Sensitivity:

A3E: < -105 dBm (SINAD 12 dB, 1 kHz 30 %)

Distortion (1 kHz, 90%):

≤ 5%

AF Bandwidth (A3E):

- 25 kHz channel spacing: > 300-3400 Hz
- 12.5 kHz channel spacing: > 300-2500 Hz

AF Noise (-13 dBm, 1 kHz, 90 %):

> 50 dB

Effective Bandwidth at 6 dB:

- 25 kHz channel spacing: ≥ ± 11 kHz
- 12.5 kHz channel spacing: ≥ ± 8.5 kHz

Adjacent channel rejection:

≥ 60 dB

Spurious rejection:

≥ 70 dB

3rd order Intermodulation (SINAD 12 dB, 100 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: < 20 ms
- Release time: < 25 ms

Audio Line Output:

Adjustable from -11 to +10 dBm in 0.5 dB step
Impedance: 600 Ω

Squelch:

- Attenuation: > 60 dB
- Type: Carrier detection or Signal/Noise ratio