

CM-400/450 (V2) Series Software Defined Radios

Advanced Information



- CM-400 (V2) VHF Receiver**
- CM-400/450 (V2) VHF 2/50W Transmitter**
- CM-400 (V2) UHF Receiver**
- CM-400/450 (V2) UHF 2/50W Transmitter**

Voice over IP (VoIP), compliant to EUROCAE ED-137A

Front panel display and keypad

Passively cooled; no fan required

<6 second boot time

>200,000 hours Mean Time Between Failure (MTBF) ground benign

Overview

The CM-400/450 Series Version 2 radios are the latest additions to the General Dynamics family of Air Traffic Control (ATC) radios. Based on the FAA NEXCOM Segment 2 radio requirements, these rack mounted transmitter and receiver systems are specifically designed to meet the dynamic mission requirements of air traffic control centers, commercial airports, military air stations and range installations.

Multimode Functionality in one Software Defined Radio

The General Dynamics UHF and VHF Digital Radios deliver more modes and a broader frequency range in a rack mount, passively cooled chassis. Advanced modes, legacy AM voice interoperability, and VoIP facilitate current and future voice and data requirements.

Key Features

- VHF: AM 25 kHz and 8.33 kHz channel spacing
- VHF: 117.975 - 136.975 MHz, optional 112 - 150 MHz
- UHF: 225 – 399.975 MHz
- 2 – 50 Watt RF output power
- Remote control and maintenance capability with built-in test
- 100% usable receive channels
- Optional embedded co-site filter
- Multiple keying and squelch options

CM-400/450 (V2) Series Digital Radios

Advanced Information

VHF/UHF General Data

- **Frequency Range:**
 - VHF: 112 – 150 MHz
 - UHF: 225 – 399.975 MHz
- **Frequency Stability:**
 - ≤ 1 ppm
- **Channel Spacing:**
 - VHF: 25 kHz, 8.33 kHz
 - UHF: 25 kHz
- **Modulation:**
 - VHF: A3E (Voice)
 - UHF: A3E (Voice)
- **Power Supply:**
 - DC power supply:
 - 24 V DC nominal (21.6 – 28.8 V)
 - AC power supply:
 - 100 – 230 VAC, 47 – 63Hz
 - Automatic switchover AC-to-DC
- **Temperature:**
 - Operating: -10°C to $+50^{\circ}\text{C}$
 - Relative humidity: 90% at 40°C (non-condensing)
 - Storage: -40°C to $+70^{\circ}\text{C}$
- **Data Interface:**
 - Ethernet
- **Maintenance:**
 - Local: Ethernet, IPV4
 - Remote: Ethernet IPV4 DHCP
 - Comprehensive: BIT, software upload
 - Setup functions: available on front panel keypad/display
 - Internal Measurements: Internal voltages, audio levels, Tx output power, FWD power, REV power, VSWR, Rx AGC voltage, Temperature
 - Maintenance Data Terminal/Human Machine Interface
- **Standards:**
 - ICAO SARPS
 - ETSI EN 300 676: VHF AM
 - ETSI EN 302 617: UHF AM
 - ETSI EN 301 489 (-1/-22)
 - EUROCAE ED-137A: VoIP
 - FAA-E-3014: VHF/UHF AM
- **VHF FCC Cert. IDs:**
 - MIJCM300V2 - CM-300 (V2) VDT
 - MIJCM350V2 - CM-350 (V2) VDT

VHF/UHF Receiver Data

- **Mechanical Characteristics:**
 - Width: 19 in
 - Overall depth: 18.5 in
 - Height: 1.75 in, 1U
 - Weight: approximately 11 lbs (with optional co-site filter installed)
- **Power Consumption (receiving):**
 - 24V DC: 500 mA typical
 - 230V AC: 180 mA typical
 - 115V AC: 270 mA typical
- **Sensitivity (with optional co-site filter installed):**
 - A3E (with cavity filter): < -102 dBm (SINAD ≥ 10 dB, 1 kHz 30%)
- **Distortion (1 kHz, 30%):** $\leq 2\%$
- **AF Bandwidth:**
 - A3E AM Voice at 25 kHz channel spacing: $> 300 - 3400$ Hz
 - A3E AM Voice at 8.33 kHz channel spacing: $> 350 - 2500$ Hz
- **AF Noise (-13 dBm, 1 kHz, 90%):**
 - > 50 dB
- **Effective Bandwidth @6dB:**
 - In 25 kHz: $> +/- 8.5$ kHz
 - In 8.33 kHz: $> +/- 3.5$ kHz
- **Adjacent Channel Rejection:**
 - VHF: ≥ 70 dB
 - UHF: ≥ 60 dB
- **Spurious Response:** ≥ 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: < 30 ms
 - Release time: < 50 ms
- **Audio Line Output:**
 - Adjustable from -25 to $+20$ dBm in 0.2 dB steps
 - Impedance: 600 ohms
- **Squelch:**
 - Carrier, Audio SNR
 - Independently selectable
 - Independently adjustable thresholds

VHF/UHF Transmitter Data

- **Mechanical Characteristics:**
 - Width: 19 in
 - Overall depth: 17 in
 - Height: 5.2 in, 3U
 - Weight: approx. 35 lbs (with optional co-site filter installed)
- **Power Consumption (50W AM – 1kHz 80%):**
 - 24V DC: 14 A typical
 - 230V AC: 2.2 A typical
 - 115 VAC: 3.9 A typical
- **RF Output Power:**
 - 2W to 50W* (adjustable in 0.2dB steps)
- **VSWR:**
 - Up to a VSWR of 3:1 without power reduction
- **Protections:**
 - Power reduction on overheating, low voltage and high VSWR
- **AM Voice (A3E):**
 - Modulation rate: adjustable from 0 to 100%
 - THD: $< 3\%$ ($m=85\%$)
 - Line input level: -25 to $+20$ dBm
 - Line input impedance: 600 ohms
- **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
- **Tx Time Out:**
 - Adjustable from 5 sec to 5 min
 - Can be disabled for continuous transmit
- **Multiple Keying Options:**
 - Variable voltage
 - Ground key
- **Spectral Purity:**
 - Harmonics: < -80 dBc (< -65 dBm in L1 and L5 GPS bands w/ optional co-site filter installed)
 - Out of band spurious: < -90 dBc
 - Noise at 1% of Fo: < -150 dBc/Hz
- **Adjacent Channel Power:**
 - AM 8.33 and 25 kHz: < -80 dBc
- **Embedded Antenna Transfer Relay (ATR) (Optional)**
 - User configurable
 - Main/standby or transceiver configurations

* Lower power transmitters with optional embedded co-site filters available. Power out with embedded co-site filters is reduced.

Contact factory for details.

GENERAL DYNAMICS

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