



Dual Channel Modem

DUAL INDEPENDENT WAVEFORM-SELECTABLE CHANNELS

Cubic's front line tactical Intelligence, Surveillance, and Reconnaissance (ISR) communications play a crucial support role for air, ground and maritime U.S. forces in combat.

The core element of Cubic's current generation small Data Link system, developed for the U.S. Navy MQ-8C Fire Scout VTUAV air vehicle, is the Dual Channel Modem (DCM). This environmentally rugged, EMI protected assembly with internal cooling solution, houses two fully-redundant, multiband miniature transceivers (MMTs); two Type 1 encryption modules capable of handling MIL-STD-704 input, and an integrated RF switch array that enables either MMT to behave as a Platform Communications Element, a Surface Communications Element or a SATCOM modem.

Full-duplex Standard CDL and Bandwidth Efficient (BE) CDL data rates up to 44.73 Mbps are available, whether the internal MMT is configured as a PCE or as an SCE. Internet Protocol packet processing time through the DCM is less than 250 ms. Waveform selection (e.g., Standard CDL, Bandwidth-Efficient CDL, MIL-STD-188-165A/B) in each MMT is independent of the other MMT, as are transmit/receive carrier frequencies and data rates. Each MMT within the DCM can transmit/receive independently in UHF, L, S, C and Ku Band. This feature allows the DCM to communicate at high data rate to a control element or other high data rate user, while simultaneously communicating with a disadvantaged user in a different band, at reduced data rate and at a different security level.

This multifunction capability also allows SATCOM communications to a Beyond Line of Site (BLOS) Ship or reach-back element, while simultaneous Line of Sight communications are occurring.

Cubic's MMTs embedded in the DCM are the outcome of a successful five-year spiral Mini-CDL development program undertaken for AFRL in 2006. This development provided a highly integrated single slice software defined radio with removable Type-1 encryption. Mini-CDL is used as the CDL module inside the USMC VideoScout terminal; Cubic has delivered more than 700 Mini-CDLs on the VideoScout program.

An external RF assembly is used to raise the ~100 mW output power of the DCM for long-range data link communications. Also contained in the RFA is a diplexer; omnidirectional or high-gain apertures are commercially available in each band of DCM operations. For SATCOM operations in Ka band, the DCM outputs the full MIL-STD L-band intermediate frequency for up-conversion to Ka frequencies.



Features and Benefits

- **Redundancy datalink capability in a compact form factor suitable for UAV's and larger manned vehicles**
- **Multi-band reception and transmission (L/S/C/Ku) offers mission flexibility for worldwide operations**
- **Dual, full duplex link capability supporting AES & Type-1 encryption**
- **Integrated video compression/decompression simplifies integration and further reduces terminal footprint**
- **Transmit and receive data rates up to 45 Mbps provides high-capacity IP channels for voice, data and video**

Specifications

Features	Dual Channel Modem
Frequency bands of operation	L, S, C, Ku
Waveforms (up to 15 stored per modem)	Standard CDL Bandwidth Efficient (BE) CDL Rev B 466 ER Tactical 1.6, 3.2, 6.4 VNW
Number of simultaneous transmit channels	2
Number of transmit data sources	2
Number of receive channels	2
Number of simultaneous receive data sources	2
PCE/SCE reconfigurable mid-mission; relay-enabled	Yes
Type-1 encryption	Yes
Type 3 encryption	NSA-approved AES
Size	5" H x 7.6" W x 12.6" D
Weight	13.2 lbs
Power	<100 W
Cooling	Dual integrated forced air fans
Open Standard interfaces	28 VDC power Dual DS-101/DS-102 for Keyfill Quad 10/100 BaseT Ethernet red interfaces Dual 10/100 BaseT Ethernet black interfaces Dual Dedicated RF ports: Ku, C, L/S Dual RS-170 analog video and audio



Cubic's Multiband Miniature Transceivers are the communications engines of the DCM. Interoperability with all Specification-compliant devices is assured, including Video Scout and ROVER.



The U.S. Navy MQ-8C Fire Scout VTUAV carries Cubic's TCDL data link.

Cubic's E-SCM Heritage

For more than two decades Cubic has designed, manufactured, integrated, and deployed transceivers for the DoD-mandated Intelligence, Surveillance, and Reconnaissance Common Data Link (CDL), used pervasively by tactical and strategic airborne, terrestrial, and maritime vehicles and their ground stations.



Northrop Grumman's E-8 Joint STARS aircraft carries the Surveillance and Control Data Link, designed and produced by Cubic.



CVN-class vessels are equipped with Cubic-built dual CDL ground data terminals.



The U.S. Navy's Fire Scout MQ-8C vertical takeoff and landing unmanned air vehicle is equipped with the Dual Channel Modem for secure delivery of ISR data generated by its sensors.