Dual Channel Modem

Features & Benefits

- edundancy 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

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.

Dual Channel Modem

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 MH-60S 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.

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