

OPTIMIZING COMMUNICATIONS FOR **GOVERNMENT & MILITARY**



Comtech EF Data recognizes the challenges government entities and military agencies encounter relative to communications. Environments are diverse – from fixed and at-the-pause to on-the-move. Bandwidth demands are ever-increasing with requirements to transmit voice, data and video traffic over both government and commercial satellite links. Compatibility between multi-site networks and remote locations is essential. Security, redundancy, and reliability are crucial. Each program has a unique set of communications requirements, which can include the use of both Commercial-off-the-Shelf (COTS) and Military Standard (MIL-STD) solutions, multi-carrier and multi-frequency, ranges of data rates and scalability.

And, depending on the location where communications systems are deployed, advanced modulation techniques may be needed to enable use of smaller antennas and remote management capabilities can be required if trained personnel are not on site.

IMMEDIATE
REMOTE ACCESS

SECURITY

LINK EFFICIENCY

SUPERIOR
PERFORMANCE

COTS & MIL-STD



COMTECH EF DATA SOLUTIONS



Comtech EF Data combines technology and expertise to facilitate communications for a variety of governments and militaries in more than 160 countries. Our line-up of satcom products offer reliability and advanced functionality that can optimize your space segment. Engineered to meet a range of standards, our products include support for:

- Defense Satellite Communications System (DSCS)
- Military Standard (MIL-STD)-188-165A
- Defense Information Systems Agency (DISA)
- Space Communications Protocol Standard Transport Protocol (SCPS-TP)
- Joint Interoperability Test Command (JITC) Certified
- OM-73 Scrambler/Descrambler
- Federal Information Procession Standards (FIPS)-140-2 Level 2 Security

SATELLITE MODEMS

We offer the widest range of modems available in the satellite industry – COTS and MIL-STD. Based on technologically advanced components and innovative designs, our modems include application software to provide superior performance and features. With the scalability and flexibility provided by our modems, users are increasing satellite link efficiency, optimizing bandwidth and transponder utilization.

Available with numerous configurations and options to support fixed, at-the-pause and on-the-move environments, our family of bandwidth efficient modems provides:

- L-Band or 70/140 MHz Support
- Range of Interfaces and Data Rates Up to 155 Mbps
- Variety of Forward Error Correction
- Selection of Modulation Techniques
- DoubleTalk™ Carrier-in-Carrier® Bandwidth Doubling
- IESS-308/309/310/314/315 Compliance
- External Switch and On-Board Redundancy
- Optional IP Module
- Management & Control

Forward Error Correction & Modulation

We offer all traditional forward error correction plus optional, advanced methods combined with higher order modulation that provide increased coding gain, lower decoding delay and significant bandwidth and power savings. Whether airborne, shipboard or ground installations, we have forward error correction and modulation designed to meet the performance requirements of diverse environments.

- Selection of modulation techniques – BPSK, QPSK, OQPSK, 8-PSK, 16-APSK, 32-APSK, 8-QAM, 16-QAM and 64-QAM
- Variety of Forward Error Correction – Low-Density Parity-Check Codes (LDPC), 2nd Generation Turbo Product Coding (TPC), DVB-S2/S, Viterbi, Sequential, Reed-Solomon, Pragmatic Trellis Coding



SATELLITE MODEMS

DoubleTalk Carrier-in-Carrier

Our revolutionary DoubleTalk Carrier-in-Carrier is based on Applied Signal Technology's patented "Adaptive Cancellation" technology that allows full duplex satellite links to transmit concurrently in the same segment of transponder bandwidth – doubling your throughput. And, when combined with our advanced forward error correction and modulation techniques, DoubleTalk Carrier-in-Carrier delivers unprecedented satellite transponder utilization.

Security

For secure environments, we offer a Transmission Security (TRANSEC) module that provides Federal Information Processing Standards (FIPS)-140-2 Level 2 security.

High Performance IP Connectivity

The IP-enabled modems take bandwidth optimization to a higher level. Available features such as Payload Compression, Header Compression and Quality of Service enable significant bandwidth savings, improve transmission quality and increase control of bandwidth provisioning.

PERFORMANCE ENHANCEMENT PROXIES

The *turboIP*® Performance Enhancement Proxies (PEPs) were designed to combat the inherent challenges of transmitting TCP over satellite links.

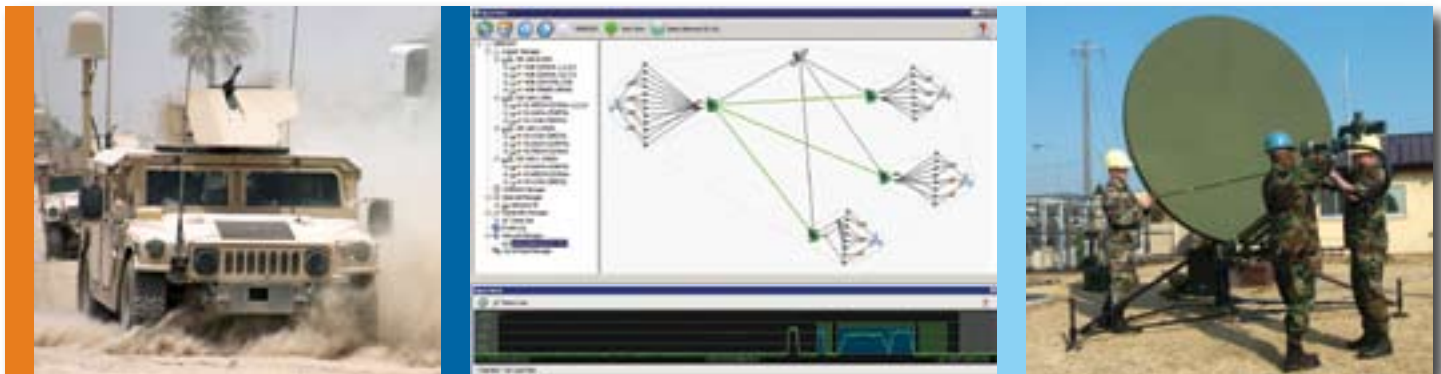


The units provide transparent acceleration of TCP sessions, increasing throughput over satellite links while requiring minimal topology changes. The Performance Enhancement Proxies support the Space Communications Protocol Standard Transport Protocol. They provide reliable connection-oriented, end-to-end data transfer for user applications. The *turboIP* units can also overcome the deficiencies that exist with TCP, including slow start and congestion control. The PEPs can be integrated into existing networks in a staged manner, avoiding the need for network-wide upgrades. Typical deployments are by government and military agencies with large or evolving satellite bandwidth requirements for Internet traffic and to support Internet backbone trunking services.



VIPERSAT NETWORK PRODUCTS – BANDWIDTH & CAPACITY MANAGEMENT

Establishing and managing vital secure communication networks is easy with our feature-rich bandwidth and capacity management products, Vipersat Management System (VMS) and Vipersat Circuit Scheduler (VCS). The Vipersat Network Products integrate with our satellite modems to provide a seamless IP-based infrastructure for satellite networking. The solution is based on dynamically managed Single Carrier Per Channel (dSCPC) and automatic application switching technologies. All aspects of the satellite network can be configured, controlled and monitored by VMS. And, VCS coordinates and optimizes network usage while assuring the highest available quality of service. Our solutions increase satellite network efficiency and provide real-time, interactive connectivity.



Vipersat Management System

VMS is an automated bandwidth, capacity and network management system with an intuitive graphical user interface. VMS enables users to easily configure satellite networks and respond to network demand. VMS automates the carrier switching and spectrum management processes within the satellite network. These capabilities allow SCPC carriers to be resized automatically based on a variety of user-defined policies, providing on-demand services and unparalleled space segment savings. Key functionality includes:

- dSCPC carrier allocation & true bandwidth-on-demand
- Automation of space segment capacity efficiencies
- User-defined policies for upstream carrier switching
- Star and full-mesh capabilities using Single Hop On Demand
- Redundant configurations with multiple backups for hub and remote hardware
- Site distribution list in multi-point automatic policy-based switching for IP multicast and mesh topologies
- Auto detects new network nodes
- Detailed event logs can be filtered and/or exported
- Simple Network Management Protocol (SNMP) MIB for integration into hierarchal NMS platforms
- Operates over multiple transponders and satellites

Vipersat Circuit Scheduler

VCS is a web-based satellite circuit scheduler that automates the setup of ad hoc SCPC connections. Circuits can be scheduled through a browser interface by date/time, circuit type, participating nodes and data. Users can view schedule status (reserved bandwidth slot, real-time link quality) and can generate analysis reports. The VCS service interacts with the Vipersat Management System for the deployment and execution of circuit scheduling. VCS enables bandwidth sharing capacity management for a variety of applications, including IP video conferencing and collaboration and high capacity file transfers.

Applications where the Vipersat Network Products combined with our satellite modems deliver the most benefit are:

- DoD Mobile Defense Vehicles
- Secure Border Patrol
- Embassy MoD Communications
- Inter/Intra Agency Secure Communications
- National Alert and Emergency Warning
- 3DES/AES Encryption and Full Redundancy

RF PRODUCTS

We offer an extensive line of RF products – converters, amplifiers, transceivers and terminals – for a range of configurations. Rugged platforms, field replaceable power supplies, redundancy and a variety of frequencies are just some of the options available.

Amplifiers

We offer a full amplifier product line with varying configurations – indoor, outdoor and low noise. The outdoor Solid State Power Amplifiers (SSPAs) are typically the category of choice by the military and government agencies.

The outdoor amplifiers are power-efficient and deliver performance. The most common applications of our outdoor amplifiers are with small flyaway terminals and in earth stations for small-to-medium sized networks or point-to-point links. The L-Band input option offers seamless connectivity to L-Band satellite modems and provides higher output power than is typically found in a block package.



We offer field replaceable power supplies for our higher power (HPOD) units, effectively addressing a limiting MTBF factor in electronic equipment. The design provides conservative thermal performance using forced air-cooling for extreme environments.

Transceivers

Flexibility and ease of installation are integral to the transceiver line. Redundant systems are an option, and a number of full monitor and control methods are available, such as convenient handheld terminals, EIA-232 or EIA-485 connections, and FSK control through our companion satellite modems.



Performance is key. Our line of C-, X- and Ku-Band transceivers delivers RF performance typically available only with independent, solid state power amplifier and frequency converter topologies. The conservative P1 dB power specifications combined with low phase noise and the high third order intercept of our transceivers ensure spectral purity and seamless support of multi-carrier links.

Multi-Band Transceiver – The MBT-4000 is a unique, outdoor Multi-Band RF transceiver. It performs C-, X- or Ku-Band to L-Band down conversion and L-Band to C-, X-, or Ku-Band up conversion. The rugged construction of the MBT-4000 is ideal for mobile and transportable applications.

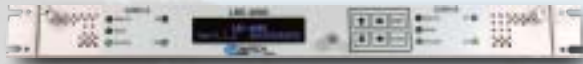




RF PRODUCTS

Converters

Comtech EF Data converters set the standard for consistent reliability and cost-effective, high-performance frequency conversion. Available in many frequencies, our converters are ideal for a variety of government and military applications.



The 4500 Series of up and down frequency converters is available in C-, X-, Ku- and Wide-Band models. For L-Band applications, we offer the LBC-4000 Up/Down Converter System, which is an indoor converter with two up or down converter modules accessed through the front panel. The up converter translates 70 MHz IF input (140 MHz optional) up to user-selectable frequency at L-Band, and the down converter translates userselectable L-Band to frequency in the 70 MHz IF Band (140 MHz optional).



Governments and militaries around the globe utilize Comtech EF Data solutions to optimize satellite links and maximize transponder utilization. Our products provide the reliability, dependability and performance you require for mission-critical communications. Contact us to learn more – Our specialists are prepared to assess where our solutions can benefit your network.



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