

NETWORK SOLUTIONS FOR MINISTRIES & GOVERNMENT AGENCIES

Comtech EF Data recognizes that ministries and government agencies encounter challenges in implementing network communications. Broadband connectivity by terrestrial means is not universally available in geographically dispersed offices, making satellite the choice for communications. Even where terrestrial capacity is available, automated satellite backup is required. Bandwidth demands often vary based on the type and location of the office and specific communication requirements (voice, video and/or data). The networks need the capacity to support bandwidth-intensive IP data applications, Voice over IP and video conferencing. Compatibility between multi-site networks is essential. Security, redundancy, and reliability are crucial. And, remote management capabilities are crucial to the maintenance and ongoing support of your network.

Comtech EF Data Solutions

Powering your satellite network with infrastructure solutions from Comtech EF Data can ensure market-leading bandwidth efficiencies and control. Our flexible network solutions for ministries and government agencies include SCPC satellite modems and dynamic bandwidth and capacity management. With products installed in 160+ countries, our line-up of satcom products offer reliability and advanced functionality that can optimize your space segment.

Features	Benefits
<ul style="list-style-type: none"> • Unique combinations of FECs & higher order modulation 	<ul style="list-style-type: none"> • Enables more efficient transmission by minimizing & matching bandwidth and power
<ul style="list-style-type: none"> • SCPC-based transport 	<ul style="list-style-type: none"> • Enables the lowest overhead with highest bits/Hz ratios
<ul style="list-style-type: none"> • Dynamic SCPC 	<ul style="list-style-type: none"> • Provides bandwidth on-demand for real-time applications
<ul style="list-style-type: none"> • Bandwidth compression 	<ul style="list-style-type: none"> • Provides significant satellite bandwidth savings
<ul style="list-style-type: none"> • Advanced IP features 	<ul style="list-style-type: none"> • Maximizes application performance
<ul style="list-style-type: none"> • Centralized configuration & control 	<ul style="list-style-type: none"> • Negates the need to have network personnel at remote locations



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Satellite Modems & Demodulators

We offer the widest range of bandwidth efficient modems and demodulators available in the satellite industry. With the innovative design, advanced FPGA-based architecture, internal Flash memory and SCPC operation, our modems provide industry-leading performance, flexibility and the lowest overhead/most efficient transport for satellite-based network communications. And, packaged in 1RU chassis, the modems and demodulators provide the rack adaptability you need.



Flexible Configurations & Security

Supporting deployment in remote and hub environments, we offer both L-Band and 70/140 MHz systems, plus data rates from 2.4 kbps to 155 Mbps. Our extensive range of IF frequencies provide the options you need for operation with single or multiple transponders, and configurations to accommodate Low Noise Block Converters and Block Up Converters. We have modems engineered to meet a range of government standards, including:

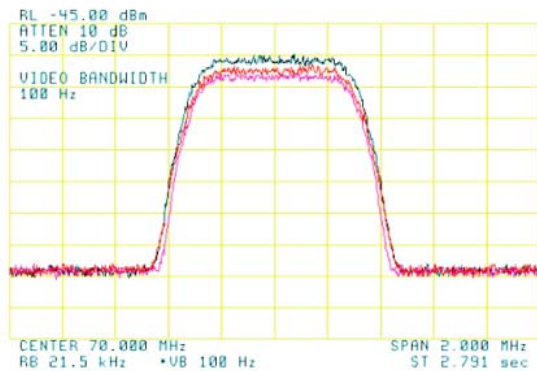
- Defense Satellite Communications System (DSCS)
- MIL-STD-188-165A
- DISA Certified

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

Variety of Forward Error Correction & Modulation

We offer traditional and advanced forward error correction (FEC). When combined with higher order modulation, our solutions can provide increased coding gain, lower decoding delay and bandwidth and power savings. For users, the results of deploying our advanced FEC and higher order modulation are optimized links.

DoubleTalk[®] Carrier-in-Carrier[®]



Allows full duplex satellite links to transmit concurrently in the same segment of transponder bandwidth

Our revolutionary DoubleTalk Carrier-in-Carrier is based on the patented bandwidth compression technology originally developed by Applied Signal Technology, Inc. Using “Adaptive Cancellation,” it allows transmit and receive carriers of a two-way link to share the same transponder space. DoubleTalk Carrier-in-Carrier is complementary to our advanced FEC and modulation techniques. As these technologies approach theoretical limits of power and bandwidth efficiencies, DoubleTalk Carrier-in-Carrier’s utilization of advanced signal processing techniques delivers a new dimension in bandwidth efficiency.

DoubleTalk Carrier-in-Carrier also allows satellite users to achieve spectral efficiencies (i.e. bps/Hz) that cannot be achieved with traditional links. For example, DoubleTalk Carrier-in-Carrier with 16-QAM modulation approaches the bandwidth efficiency of 256-QAM (8bps/Hz).

IP-Based Functionality

With its innovative architecture and advanced capabilities, the IP Module is designed to provide bandwidth efficient IP transport while maintaining network performance. With optional, advanced features such as Header Compression, Payload Compression and Quality of Service (QoS), bandwidth optimization can be taken to a new level.

- IP Header Compression – Configurable on a per-route basis, reduces the required Voice over Internet Protocol (VoIP) bandwidth by as much as 60% (G.729a). Typical Web/HTTP traffic can also be reduced by 10% via IP/TCP header compression.
- Lossless Payload Compression – Applied to the entire Layer 2 (Ethernet frame) or Layer 3 (IP datagram) packet optimizing traffic and reducing satellite bandwidth up to 40%.
- Multi-Level Quality of Service (QoS) – Reduces jitter and latency for real time traffic (voice and video), provides priority treatment to mission critical applications and allows non-critical traffic to use the remaining bandwidth.



Also available for the IP Module is a data encryption option. Configurable on a per route basis, the 3xDES data encryption feature can prevent unauthorized access to data transmitted over the satellite link.

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 agencies with large or evolving satellite bandwidth requirements for Internet traffic and to support Internet backbone trunking services.

Vipersat Network Products

Our feature-rich bandwidth and capacity management products work with our modems to increase efficiency and provide real-time, interactive connectivity in fixed and mobile satellite networks. The solution is server-based and includes dynamically managed Single Carrier Per Channel (*dSCPC*) and automatic application switching technologies. All aspects of the satellite network can be configured, controlled and monitored while coordinating and optimizing network bandwidth and capacity. Vipersat Network Products enable network administrators and satellite service providers to easily configure networks, to respond to anomalies, and to utilize bandwidth when and where it is needed.

Dynamic Bandwidth Allocation

Our modem technologies combined with our Vipersat Management System (VMS) provide dynamic SCPC capacity management solutions. When a node in the network has an application to transport over the satellite link, *dSCPC* provides the mechanism to automatically establish the SCPC carrier for that transmission. It resizes the carrier based on the data flow, and tears down the link when the transmission is completed.

Based on the needs of your ministry or agency, we provide a number of methods to resize the SCPC carrier from remote locations:

- Dynamically based on the application or load
- Via a pre-determined schedule using the Vipersat Circuit Scheduler (VCS)
- Manually by the VMS operator

The dynamic bandwidth allocation is particularly beneficial to users who employ satellite links for transport of real-time applications, such as VoIP, video conferences, file and image transfers. The results are the ability to share bandwidth and to provide efficient, low latency and low jitter bandwidth on-demand services.



3D view dynamically displays real-time status and operation of the network

Centralized Network Management

Our state-of-the-art VMS allows intelligent management of satellite networks through system configuration and alarm management of the network. The graphical user interface of VMS enables centralized network configuration and management. It provides auto-detection of satellite modems, configuration and monitoring of the modems, real-time views of network health and transmission quality, and allows operators to easily modify these devices. More than a traditional network manager, VMS manages satellite transmission bandwidth and topology changes based on traffic types.

VMS is based on a client/server architecture where a central hub communicates with remote nodes. The server maintains all databases in a centralized location accessible to all clients, so updates can be made in a single location and distributed globally to clients.

Remote Connectivity

Our network solutions enable efficient and high quality communications. Utilizing VoIP and video conferencing, accessing e-mail and client/server applications, and transmitting file transfers are facilitated via our real-time, two-way connectivity between remote facilities and your hub. And, when our network solutions are combined with adequate RF sizing of your remote antenna and BUC, your remote facilities can have rapid and dynamic point-to-point mesh connections without the need for multiple carrier and/or one-to-one multi-receiver links.

Our network solutions facilitate bandwidth-efficient and flexible satellite communications connectivity for ministries and government agencies. Our superior link performance and unique technologies can optimize your space segment, maximize your transponder utilization and solve key communications challenges. Contact us to learn more – our network specialists are prepared to assess where our solutions can benefit your network.



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