

## **New Product Innovation of the Year Award Satellite Communication Modems North America, 2010**

### **Frost & Sullivan's Global Research Platform**

Frost & Sullivan is entering its 50<sup>th</sup> year in business with a global research organization of 1,800 analysts and consultants who monitor more than 300 industries and 250,000 companies. The Company's research philosophy originates with the CEO's 360 Degree Perspective,\* which in turn serves as the foundation of its TEAM Research\*\* methodology. This unique approach enables us to determine how best-in-class companies worldwide manage growth, innovation and leadership. Frost & Sullivan is proud to present the 2010 North American New Product Innovation of the Year Award in Satellite Communication Modems to Comtech EF Data.

### **Significance of the New Product Innovation of the Year Award**

#### *Key Industry Challenges Addressed by Comtech EF Data*

High-capacity services and improved reliability at a relatively low cost are only some of the demands facing satellite operators and service providers from their defense clients. At present, the existing operators and service providers are constantly looking at improving the bandwidth utilization and user throughput to stay ahead of others in terms of services and terrestrial capacity. The following are the common challenges faced by satellite operators:

- **Total Cost of Ownership (TCO)**

It is widely acknowledged in the satellite communications industry that the high cost of services is a major restraint for growth. However, Satellite operators and service providers are finding it difficult to provide cheaper services, because they are encumbered with a high TCO resulting from high capital expenditures (CAPEX) and high operating expenditure (OPEX).

- **Bandwidth Management**

Besides cost, bandwidth insufficiency is touted as the most critical challenge to be addressed, as the demand for bandwidth continues to grow faster than the currently available technology. Governments worldwide are turning to commercial satellite companies, as their military satellites are unable to satisfy the demand for bandwidth. Despite satellite communications comprising a significant portion of modern military communications, none, including in the US, have a sufficient dedicated supply of military satellite capacity that is commensurate with the exponentially growing demand for bandwidth. In fact, the US Pentagon's bandwidth needs are not expected to be satisfied internally before 2020, especially with the

delay in programs such as the Transformation Satellite System (TSAT). Thus, there has been a strong need in the satellite communications industry for bandwidth-efficient and cost-effective communication solutions.

In this regard, Comtech EF Data has made some significant contributions by providing solutions that lower costs and also simultaneously optimize bandwidth. The CDM-750 High-Speed Trunking Modem combines DVB-S2 (digital video broadcasting satellite, second generation), ACM (adaptive coding and modulation), GZIP lossless data compression, and DoubleTalk<sup>®</sup> Carrier-in-Carrier<sup>®</sup> technologies.

### **Impact of New Product Innovation of the Year Award on Key Stakeholders**

The New Product Innovation of the Year Award is a prestigious recognition of Comtech's accomplishments in the field of Satellite Communication Modems. It is Frost & Sullivan's firm belief that such recognition can have a profound impact in enhancing the brand value and thereby accelerating the growth of Comtech EF Data. As captured in Figure 1 below, by researching, ranking, and recognizing those who deliver excellence and best practices in their respective endeavors, we hope to inspire, influence, and impact three specific constituencies:

- **Investors**

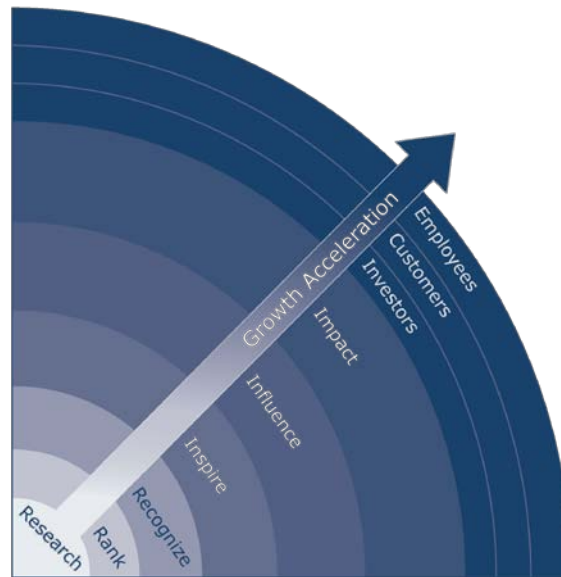
Comtech's current investors will be pleased to gain favorable press from an impartial third party with high industry credibility. Similarly, prospective investors are likely to favor companies with a well-established reputation for excellence.

- **Customers**

A Best Practice Award will reassure customers that they are allied with an organization unmatched in its field.

- **Employees**

This Award represents the creativity and dedication of Comtech's executive team and employees. Such public recognition can boost morale and inspire these stakeholders to continue the best-in-class pursuit of a strong competitive position for Comtech EF Data.

**Figure 1: Best Practices Leverage for Growth Acceleration****Key Benchmarking Criteria for New Product Innovation of the Year Award**

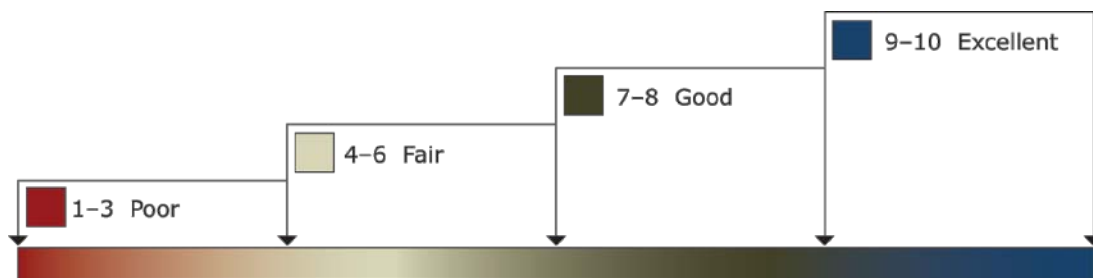
For the New Product Innovation of the Year Award, the following criteria were used to benchmark Comtech's performance against key competitors:

- Innovative Element of the Product
- Leverage of Leading Edge Technologies
- Value Added Features/Benefits
- Increased Customer Value
- Customer Acquisition/Penetration Potential

## Decision Support Matrix and Measurement Criteria

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Matrix (DSM). The DSM is an analytical tool that compares companies' performance relative to each other with an integration of quantitative and qualitative metrics. The DSM features criteria unique to each Award category and ranks importance by assigning weights to each criterion. The relative weighting reflects current market conditions and illustrates the associated importance of each criterion according to Frost & Sullivan. Fundamentally, each DSM is distinct for each market and Award category. The DSM allows our research and consulting teams to objectively analyze each company's performance on each criterion relative to its top competitors and assign performance ratings on that basis. The DSM follows a 10-point scale that allows for nuances in performance evaluation; ratings guidelines are shown in Figure 2.

**Figure 2: Performance-Based Ratings for Decision Support Matrix**



This exercise encompasses all criteria, leading to a weighted average ranking of each company. Researchers can then easily identify the company with the highest ranking. As a final step, the research team confirms the veracity of the model by ensuring that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

**Figure 3: Frost & Sullivan's 10 Step Process for Identifying Award Recipients**



## Best Practice Award Analysis for Comtech EF Data

The Decision Support Matrix, shown in Figure 4, illustrates the relative importance of each criterion for the New Product Innovation of the Year Award and the ratings for each company under evaluation. To protect the interests of the Award recipient’s competitors, we have chosen to refer to them as Competitor 1 and Competitor 2.

**Figure 4: Decision Support Matrix for New Product Innovation of the Year Award**

<i>Measurement of 1–10 (1 = lowest; 10 = highest)</i>	<b>Award Criteria</b>					
	Innovative Element of the Product	Leverage of Leading Edge Technologies	Value Added Features/Benefits	Increased Customer Value	Customer Acquisition/Penetration Potential	<b>Weighted Rating</b>
<b>Relative Weight (%)</b>	<b>15%</b>	<b>30%</b>	<b>15%</b>	<b>20%</b>	<b>20%</b>	<b>100%</b>
Comtech EF Data	8	9	8	8	9	8.5
Competitor 1	8	8	7	7	8	7.75
Competitor 2	7	8	7	7	8	7.5

### Criterion 1: Innovative Element of the Product

Realizing the gradual shift in the industry toward Internet Protocol (IP) features, Comtech has developed advanced IP-based solutions for maximizing satellite link performance and reducing the TCO. The IP module in Comtech’s modems is designed to provide bandwidth-efficient IP transport while maintaining the network’s high performance levels. The modem also possesses advanced technological features, such as lossless data compression, which reduces satellite bandwidth consumption by up to 60% while guaranteeing end to end bit integrity.

Comtech’s novel bandwidth-efficient modems are ideal for optimizing satellite communications, since their designs are based on advanced field programmable gate array (FPGA) architectures and use 32-bit processors, which allows considerable flexibility and facilitates a large feature set. Comtech’s advanced technologies also ensure a high quality of service (QoS) by reducing jitter and latency for real time traffic, providing priority treatment for mission critical applications and allowing non-critical traffic to make use of the remaining bandwidth.

The CDM-750 from Comtech, has been developed to accommodate the most demanding Internet Service Provider (ISP) and telco backhaul links by offering end-users the most advanced combination of space segment saving capabilities, while also minimizing the need for unnecessary overhead.

### **Criterion 2: Leverage of Leading Edge Technologies**

Some striking examples of Comtech's excellence in providing technologically advanced solutions include the implementation of VersaFEC, a system of short-block, low latency Low Density Parity Check (LDPC) codes designed to support latency-sensitive applications, Low Density Parity Check (LDPC) and Turbo Product Coding (TPC) forward error correction techniques for enhanced performance, DoubleTalk Carrier-in-Carrier, a bandwidth doubling technology, a dynamically managed single carrier per channel (dSCPC) technology, and a patented Daisy Chain protection switching technology.

Within the CDM-750, Comtech has implemented the Adaptive Coding and Modulation (ACM) operation in order to convert the link margin to user capacity during nonfaded conditions, by taking advantage of the actual signal to noise ratio, instead of calculating the worst case signal to noise. ACM transforms link margin, implementation margin and margin for antenna pointing directly to improved throughput. The company has used efficient encapsulation methods by which they have tried to increase throughput with minimal overhead.

In addition to this, the CDM-750 leverages Comtech EF Data's Double Talk Carrier-in-Carrier "Adaptive Cancellation" technology. The Carrier-in-Carrier is based on Applied Signal Technology's DoubleTalk bandwidth compression technology. DoubleTalk leverages Adaptive Cancellation that allows transmit and receive carriers of a full duplex satellite link to be transmitted in the same transponder space. When this is coupled with advanced forward error correction and modulation techniques, it enables the satellite operators to reduce the operational and capital expenditure, and enables them to make the best possible use of the satellite resource.

### **Criterion 3: Value Added Features/Benefits**

Another advantage offered by Comtech's innovative technologies is the multi-dimensional optimization capability that is possible with its products. Comtech's CDM-750 allows considerable flexibility for both optimizing existing satellite links and for planning new optimal links. Most of Comtech's products are built using a software-defined architecture, which offers a considerable amount of latitude during the planning and commissioning phases of new satellite links and in the design of a new satellite network. Comtech's novel technological solutions are applicable for a wide variety of applications that include cellular

backhaul, high speed trunking, offshore communications, communications-on-the-move, and satellite news gathering.

**Criterion 4: Increased Customer Value**

The ACM and Double Talk Carrier-in-Carrier technologies offer enormous savings to the ISPs and telecom operators. With the ability to overlay TX and RX carriers, Carrier-in-Carrier enables the operator to establish the perfect balance between bandwidth and power, enabling the best possible use of the satellite resource and reducing OPEX.

The innovative high-performance architecture of the CDM-750 allows efficient networking and transport over satellite links while supporting a wide range of applications and network topologies. By using efficient encapsulation methods, the CDM-750 further increases throughput by using minimal overhead. In G.703 synchronous mode, users can implement monitor and control over the satellite with no additional overhead. When using Ethernet bridge mode, less than 1% overhead is used for encapsulation. Frost & Sullivan believes that this product innovation transforms into more cost effective and increased operational benefits for the end-users, compared to other technologies on the market.

**Criterion 5: Customer Acquisition/Penetration Potential**

Common applications of CDM-750 from Comtech EF Data include disaster recovery and emergency communications, IP trunking, G.703 trunking and high speed content delivery. The typical end-users for the CDM-750 include mobile Military and Government agencies, mobile operators, telecom operators and Internet Service Providers (ISPs).

Comtech has a strong R&D team, with developers focusing on technology development. Comtech EF Data's parent company, Comtech Telecommunications, has a strong commitment to technology development and constant innovation, as is evident through its consistently increasing R&D expenditure. In Fiscal year 2009, Comtech Telecommunications spent about 11% of its total revenue for R&D operations.

Comtech EF Data has also received very favorable reviews from customers who have implemented its products for various applications. Typically, customers are ready to trade CAPEX by investing in Comtech's novel products for the resulting OPEX savings they offer. The company also strives to stay ahead in the technology race by keenly following technological developments worldwide and implementing them in its products. Frost & Sullivan research reveals that Comtech's products with advanced technological features are likely to have a strong impact on the growth of this industry.

Based on the company's leading innovation and unique, best practices approach to the satellite communication modems market, Comtech EF Data is the recipient of the 2010 Frost & Sullivan New Product Innovation of the Year Award.



## The CEO 360 Degree Perspective™ - Visionary Platform for Growth Strategies

The CEO 360 Degree model provides a clear illustration of the complex business universe in which CEOs and their management teams live today. It represents the foundation of Frost & Sullivan's global research organization and provides the basis on which companies can gain a visionary and strategic understanding of the market. The 360 degree perspective is also a “must-have” requirement for the identification and analysis of best-practice performance by industry leaders.

The 360 degree model enables our clients to gain a comprehensive, action-oriented understanding of market evolution and its implications for their companies' growth strategies. As illustrated in Figure 5 below, the following six-step process outlines how our researchers and consultants embed the 360 degree perspective into their analyses and recommendations:

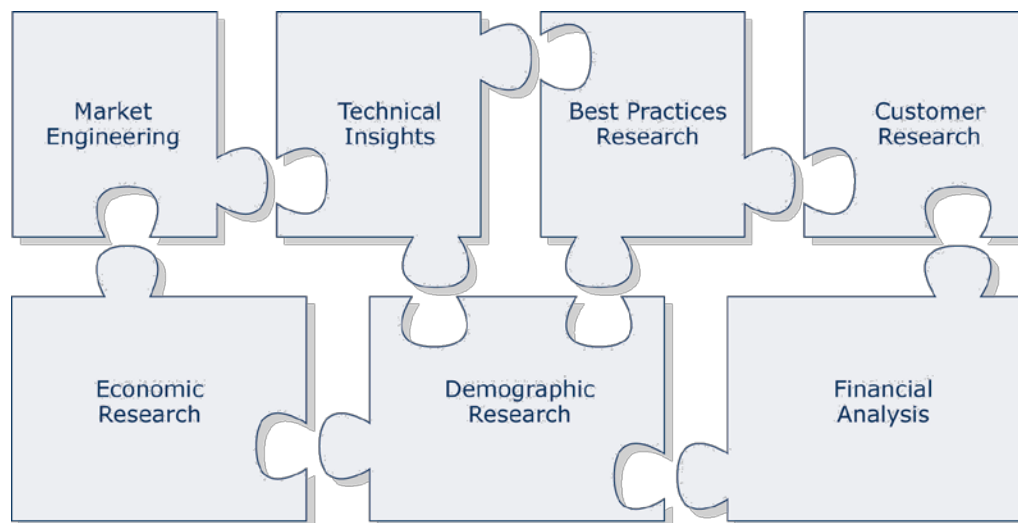
**Figure 5: How the CEO's 360 Degree Perspective Directs Our Research Process**



## Critical Importance of TEAM Research

Frost & Sullivan's TEAM Research methodology represents the analytical rigor of our research process: it offers a 360 degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Our experience has shown over the years that companies too often make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Frost & Sullivan contends that the successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices and demographic analyses. In that vein, the letters T, E, A and M reflect our core technical, economic, applied (financial and best practices) and market analyses. The integration of these research disciplines into the TEAM Research methodology provides an evaluation platform for benchmarking industry players and for creating high-potential growth strategies for our clients.

**Figure 6: Benchmarking Performance with TEAM Research**



## About Comtech EF Data

Headquartered in Tempe, Arizona, Comtech EF Data is a subsidiary of Comtech Telecommunications Corporation, and is involved primarily with the development of a range of satellite communication products and equipment, both for commercial and military applications. Comtech EF Data differentiates itself in the industry through the introduction and application of revolutionary technologies in its products, with the cardinal goal of reducing TCO for its customers. Besides upholding its reputation as a technology innovator in the field of Satellite Communications, Comtech EF Data, in order to maintain itself as a technological pioneer, has also, over the years, acquired several companies with innovative technologies and products in this domain. Comtech's acquisition of Montreal, Quebec-based Memotec Inc., a leading innovator in satellite network optimization; Tempe, Arizona-based Radyne Corporation, a leading provider of novel satellite modems and

gateways; and network backhaul assets and the NetPerformer and AccessGate product lines of Verso Technologies Inc, stand testimony to the company's mission towards providing technologically advanced suite of products to its customers.

### **About Frost & Sullivan**

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best in class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages almost 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 31 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.