

The New Generation of C-Band modem

Ipsat Modem or Comtech EF Data modem or IDirect NetModem II+

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Commercial Proposal for VSAT C-band Internet Access Solution A Satellite Internet Access Solution



IDU Highlights

- ✔ Transmit rate 9.6 kbps - 2.0 Mbps SCPC
- ✔ Receive rate up to 72.5 Mbps (45 MSps) DVB
- ✔ Supports static routing
- ✔ LAN interface: 10/100 BaseT Ethernet
- ✔ Provides DC and reference clock for ODU
- ✔ Remote management via Telnet and In-band protocol
- ✔ Open standards:
 - Receive: DVB MPE
 - Transmit: HDLC/WAN

ODU Highlights

- ✔ Ku-band low-cost block upconverter units up to 4 watts, and C-band up to 5 watts internal power supply
- ✔ Optional 48 Vdc power supply drives up to 20 watt ODU
- ✔ Small 1.2, 1.8 and 2.4 meter antennas

Overview

The Radyne ComStream IPSat® is a one-box *Internet Anywhere* solution. The IPSat® integrates Radyne ComStream's expertise in satellite modem technology with embedded, speed-optimized IP processing to provide the highest throughput and the greatest level of integration in the industry. The IPSat® can offer the most flexible, cost-efficient performance for high-speed satellite IP connections.



CDM-570L L-Band Satellite Modem

Ideal for optimizing satellite communications, the CDM-570L is designed to meet the needs of low-cost terminals with L-band interfaces to Low Noise Block Converters (LNBS) and Block Up Converters (BUCs).

The CDM-570L includes synchronous EIA-530/422, v.35, EIA-232 and g.703 interfaces. An optional Internet Protocol (IP) Module is available with a 10/100 BaseT Ethernet interface for LAN and network applications.

The architecture is firmware and FPGA-based, and the Internal Flash memory allows easy updating via the serial port, or front panel USB port. The modem offers exceptional flexibility and cost-effective performance in 1RU enclosure.

FEATURES

- 950 to 1950 MHz IF range
- Fast acquisition demodulator (+/- 32kHz acquisition range, 64 kbps, Rate 1/2 QPSK: 150 ms average)
- BPSK, QPSK, OQPSK, 8-PSK, 16-QAM modulation types
- Data rate range from 2.4 kbps to 5 Mbps
- Forward Error Correction choices include Turbo Product Coding, Viterbi, Reed-Solomon, and TCM
- Automatic Uplink Power Control (AUPC) and EDMAC Asymmetric Loop Timing
- Built-in 1:1 redundancy controller (Y-cables for data, simple and inexpensive external module for RF)
- Operation with LNB and BUC
- BUC 10 MHz reference and FSK communications and optional BUC Power Supplies
- LNB Power Supply and 10 MHz reference
- Backwards compatible with the CDM-500/CDM-550, CDM-550T and CDM-600 and CDM-600L
- Interoperable with SDM-300A, SDM-300L3
- Ethernet M&C interface
- IP Module option
- Vipersat Management System (VMS)

Scope of this Proposal

This proposal details the technical, commercial and project terms and conditions applicable to the supply, implementation and support of the VSAT Internet access solution for the Africa and Middle East

market using C-band services. The proposal is prepared in response to enquiries from the market and is aimed at providing decision makers all relevant information applicable to this leading connectivity solution.

Based on this proposal decision makers will be able to select the solution as their preferred solution for Internet Connectivity as well as the specific equipment configuration that is required for the applicable scenario.

The solution provides high-bandwidth Internet Access Services over a satellite communication channel and is an ideal solution for:

- **Internet trunking links from ISP point-of-presence to the International backbone.**
- **Internet access for hotels and other commercial centers.**
- **Internet access for Universities, schools and other educational centers.**
- **International gateway for voice-over-IP telephone operators**
- **International communication between remote corporate offices and the international backbone.**
- **Implementation of virtual private networks between corporate head office and remote offices.**

Applications

Internet Access

The solution provides direct first tier Internet Access to the international backbone from Fuchsstadt Germany Teleport. Allocation and management of Internet Access and IP number blocks must be coordinated and contracted by the client directly with Diacomm. Once defined Diacomm can assist with the in-field implementation but this excludes the configuration of client router equipment and other Internet network configuration tasks.

VoIP Solution

The high-bandwidth access capacity of the solution elegantly supports Voice-over-IP (VoIP) telephony applications. VoIP telephony service is provided for originating of international calls as well as for originating domestic calls from site-to-site.

In a corporate network calls from one VSAT to another can be made at no extra cost while international telephony services can be provided on a prepaid billing platform, which integrates calling card technology.

VoIP services can be implemented with the Diacomm iCall solution that is elegantly integrated with the solution, alternatively the VoIP services can be implemented with customer selected third party vendors.

Virtual Private Networks

The solution provides an effective platform to implement corporate virtual private networks. Using IP routing technology data communication is effectively implemented between the hub and remote sites in star configuration.

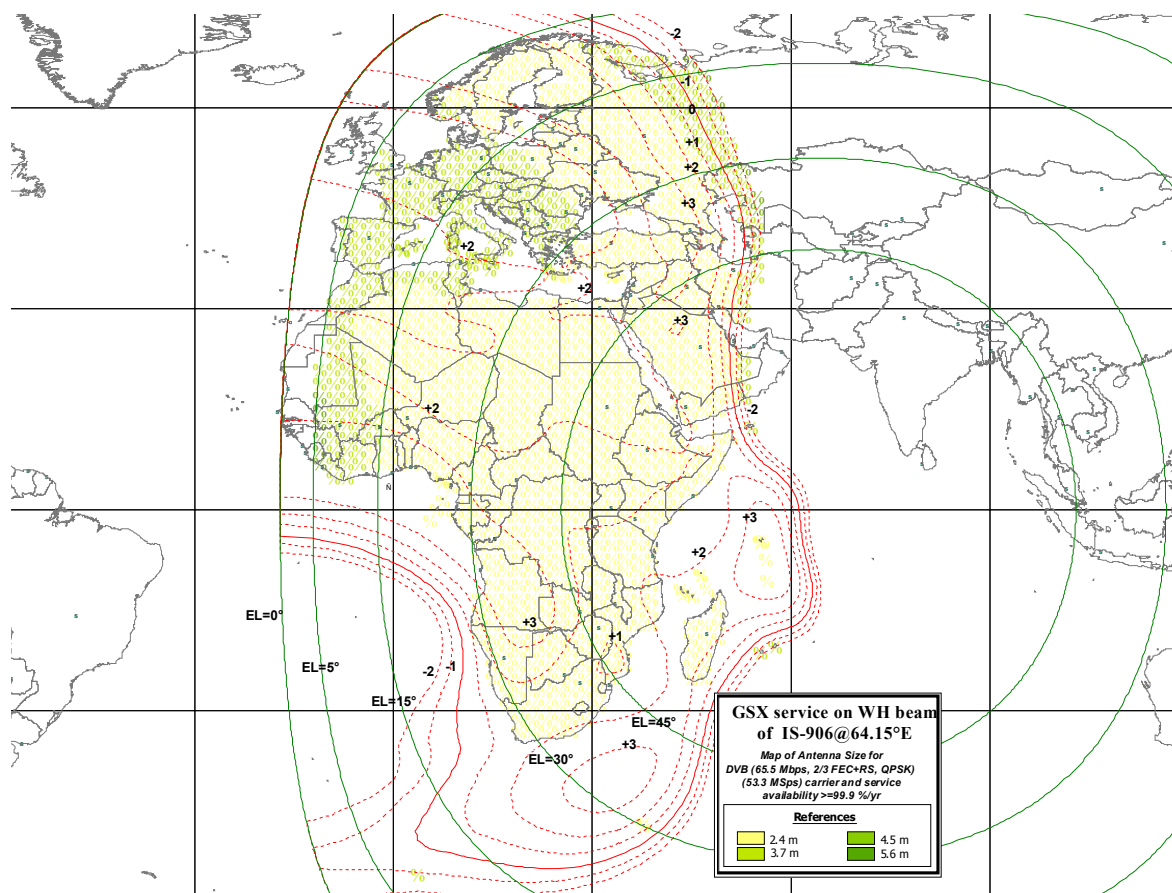
Key Characteristics

The Solution provides the most cost effective and integrated solution for achieving flexible highspeed connectivity via the satellite.

Key system characteristics are:

- **A direct connection, via satellite channel, to first tier Internet backbone.**
- **By integrating the receiver, transmitter and modem into a single electronic unit it further decreases the system cost as well as minimizing implementation and support costs.**

- The electronic unit supports up to 4Mbps receive and 2Mbps transmit, thus allowing system growth without the need for electronic upgrades while still maintaining a low entry equipment cost.
- Changing the RF transmitter module from 5W, 10W or 20W enables in-the-field system growth.
- The system provides dedicated connectivity and the quoted system bandwidth is not shared with any other customer.



Network Description

The solution consists of:

- a) A network hub with a single very high-speed (42 Mbps) transmit and multiple return links.
- b) A C-band satellite communication channel.
- c) VSAT remote terminals installed at the customer premises.

Communication from the hub to the remote is over a Digital Video Broadcasting (DVB) channel that broadcasts data at 40Mbps to all the remote terminals. Data destined for a specific remote terminal is encoded with a unique Packet Identification (PID) for that terminal and only the remote terminal decodes that data. Communication from the remote to the hub is over a dedicated SCPC carrier, which modulates the data on a specific carrier frequency for transmission to the hub.

Data in both directions is encapsulated as TCP/IP traffic that enables direct integration with a local LAN at the remote and the Internet at the hub. Being TCP/IP-based data, transmission over the satellite is “packet-oriented” and “session-based”; this should be noted when configuring the local LAN and other user equipment.

Service Area & Equipment Sizing / Intelsat 906 at 64.15 deg E

Intelsat offers services from Fuchsstadt Germany, to East, South and West Africa.

IP Number Allocation

A total of 8 IP numbers are supplied with the equipment, the respective VSAT equipment items use 3 and 5 are available for use by the client. Additional IP numbers can be made available but this must be specifically applied for.

Voice-over-IP Telephony Services

Diacomm also offers an integrated web-enabled Voice-over-IP telephony solution that enables customers to offer prepay calling card services, call center services and corporate telephony services.

The Diacomm VoIP solution is known as the iCall solution and includes web-enabled accounting systems that provides full details on call records and accounting transactions.

System Equipment Items

The remote system comprises of:

- 2.4m or 3.7m antenna**
- 5W, 10W or 20W radio**
- IPSat satellite modem or Comtech EF Data modem**

Engineering & Equipment Support Services

Engineering Support Services

The service will be supported by the Diacomm engineering office and includes telephone engineering support service and equipment failure call-out services. These support service is included in the monthly service charge and no additional charge will be levied.

Support services relating to customer network problems and call-out which is not due to the VSAT equipment failure will be charged at the standard engineering rates. Engineering support and helpdesk contact details

Equipment Support Services

All products supplied by Diacomm are underwritten by a 12-month manufacturer's warranty. Diacomm maintains a critical level of spare equipment items at the engineering office that can be made available to customers as interim replacement units in the event of equipment failures.

Bandwidth & Internet Access Charges

Item	IntelSat C -Band
128kbps Rx / 64kbps Tx	\$1,650
128kbps Rx / 128kbps Tx	\$1,850
256kbps Rx / 128kbps Tx	\$2,880
256kbps Rx / 256kbps Tx	\$3,550
384kbps Rx / 128kbps Tx	\$3,560
512kbps Rx / 128kbps Tx	\$4,400
512kbps Rx / 256kbps Tx	\$4,780
512kbps Rx / 384kbps Tx	\$5,965
512kbps Rx / 512kbps Tx	\$6,400
768kbps Rx / 256kbps Tx	\$6,400
768kbps Rx / 384kbps Tx	\$7,200
1024kbps Rx / 256kbps Tx	\$7,912
1024kbps Rx / 512kbps Tx	\$7,880
1024kbps Rx / 1024kbps Tx	\$11,500

Contract Payment Options and Terms:

1) No contract – no deposit: Services can be provided on a month-by-month basis without any contracts and contract deposits payable. When no contract deposit is paid, standard rates will apply and no monthly discounts are granted, services will be terminated should payment not be received by the 7th of each month.

2) 1 Month contract deposit: Alternatively services can be provided on 1 year contract basis and 5% discount will be granted for payment received before the 3th of each month, services will be terminated should payment not be received by the 3th of the following month.

3) Quarterly payments: 5% discount is granted for advance quarterly payments, services will be terminated should payment not be received by the 3th of the first month of the following quarter.

4) All other terms and conditions are incorporated in the 1-year service agreement that must be signed prior to the activation of any service.

5) a Connection fee of \$ 1000 per remote is payable prior to activation of a remote terminal and with each change in bandwidth allocation.

Item	C-Band	Diacomm's value offer
Two-way DVB / SCPC Earth Station Systems (CIF)		
2.4m Antenna (Ex-warehouse USA), 5Watts BUC , IPSAT Modem – C Band		\$9,943.00
OR		
b. 2.4m Antenna (Ex-warehouse USA), 5Watts BUC , Comtech EF Data Modem – C Band		\$9,510.00
OR		
c. 2.4m Antenna (Ex-warehouse USA), 5Watts BUC , IDirect NetModemll + – C Band		\$7,800.00
DVB VSAT Earth Station Equipment Costs		
a. Supply of integrated DVB receiver, SCPC transmitter and modem unit, RF transceiver unit & antenna system.		Included
b. Air freight & Insurance of antenna system		\$1,300.00
c. Hub installation and configuration, space segment allocation and circuit commissioning		Included
e. Monthly telephone and e-mail engineering support services		Included

Monthly telephone and e-mail engineering support services included

Excluded:

The quoted pricing excludes the following, which are for the client's account:

1. Duties and clearing charges for delivery in Africa and Middle East.
2. Antenna king post and foundation required for the antenna installation.
3. Set-up and configuration of client router equipment and server network.
4. International flights and expenses as well as in-country travel and accommodation costs.

Terms & Conditions

Validity: This proposal is valid for 30 days.

Price basis: Turn-key.

Payment: Payment by direct wire transfers on placement of order.