iDIRECT TECHNOLOGIES

speed | broadband IP | superior technology | satellite | reliable | anywhere | high speed | broadband IP | superior technology | satellite | reliable | anywhere | high speed | broadband IP | superior technology | satellite | reliable | anywhere | high speed |

# iDirect Broadband Router Hub Solutions

## Convert your legacy earth station into a world-class IP gateway

Realize the
**Benefits of our**
Bi-directional, Shared
**TDMA solution**
**NOW!**

### A GROWING OPPORTUNITY

There is enormous demand for high-speed broadband IP services, especially in remote areas poorly served by land-based solutions. According to Northern Sky Research, the total global market for IP-based satellite services will grow from $1.053 billion in 2002 to $4.331 billion in 2007, representing roughly 1.72 million global enterprise satellite sites. Prospects for equipment (CPE) sales are equally impressive, with the market expected to produce cumulative sales of $3.64 billion between 2002 and 2007.

To capitalize on this growing market opportunity, legacy earth stations must be converted to broadband IP gateways, that will expand your reach to remote customers badly in need of broadband connectivity, and generate new revenue opportunities. Plus, with an IP gateway based on an iDirect platform, advanced bandwidth sharing techniques allow you to support more customers in the same capacity — drastically reducing your overall operating costs.

### THE RIGHT SOLUTION PARTNER

Transitioning a network must be done carefully. With revenue and network costs at stake, it's critical to select the right solution partner. You must find a company that can reduce costs during and after the teleport transition.

The right technical solution will enable you to:

- Implement a full IP network with the lowest capital costs
- Increase revenues and reduce recurring operating expenses
- Support diverse needs of enterprise IP networks with effective infrastructure and technology tools
- Efficiently manage networks with an unparalleled Network Management System (NMS)
- Use relevant satellite frequencies, including C, Ku and emerging Ka-band
- Build multiple networks from a common hub platform
- Scale to support current and future applications
- Interface with up to 5 different satellites through a single Hub

## SUPERIOR TECHNOLOGY IS BUILT RIGHT IN

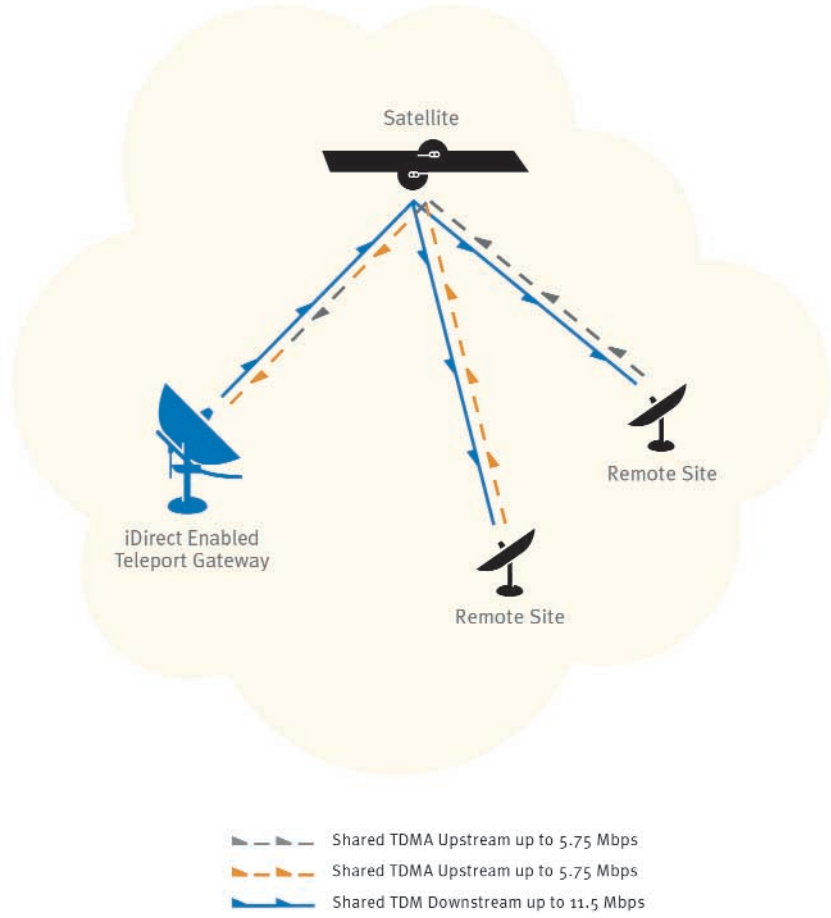
The advanced Enterprise Class solution by iDirect Technologies is built from the ground up to support broadband IP via satellite. Our IP over satellite technology resides throughout the network — in the iDirect Hub Chassis used by network operators and in the iDirect NetModem II *Plus* remote systems deployed at business sites by service providers. And, because we design, engineer and control manufacturing of our equipment ourselves, you can be confident of a high-quality end-to-end solution.

In addition to industry-leading technologies including **TDMA, Turbo Product Codes,** and **TCP Acceleration,** iDirect offers unique capabilities that let you realize more revenue opportunities through *highly* efficient bandwidth usage, greater flexibility, and enhanced reliability and performance.

**Deterministic TDMA Network Architecture** (D-TDMA) results in industry-leading efficiency that lets you carry more applications and traffic over your available bandwidth. D-TDMA enables new applications such as Voice over IP (VoIP), to efficiently operate in a shared environment.

**Quality of Service** (QoS) features enable you to provide a host of flexible service and application options for customers.

**Capacity Optimization** is inherent throughout the iDirect solution. With 1.2 Carrier Spacing we deliver 14% savings in bandwidth, through more efficient use of your transponder capacity. In addition, by using a native IP solution you'll save 10-50% capacity vs. an inefficient MPEG Encapsulation scheme.




## SUPPORTING TODAY'S IP APPLICATIONS

iDirect's technology enables enterprises of all sizes to support their LAN-to-LAN and Internet applications, regardless of their location. It supports:

- Corporate intranets/extranets
- E-mail
- E-procurement
- Corporate databases and distributed applications
- Large file transfer, including image transfers
- VPN
- Video
- Voice over IP (VoIP)
- Multicasting
- Web research
- Distance learning

## A WIDER RANGE OF CONFIGURATIONS

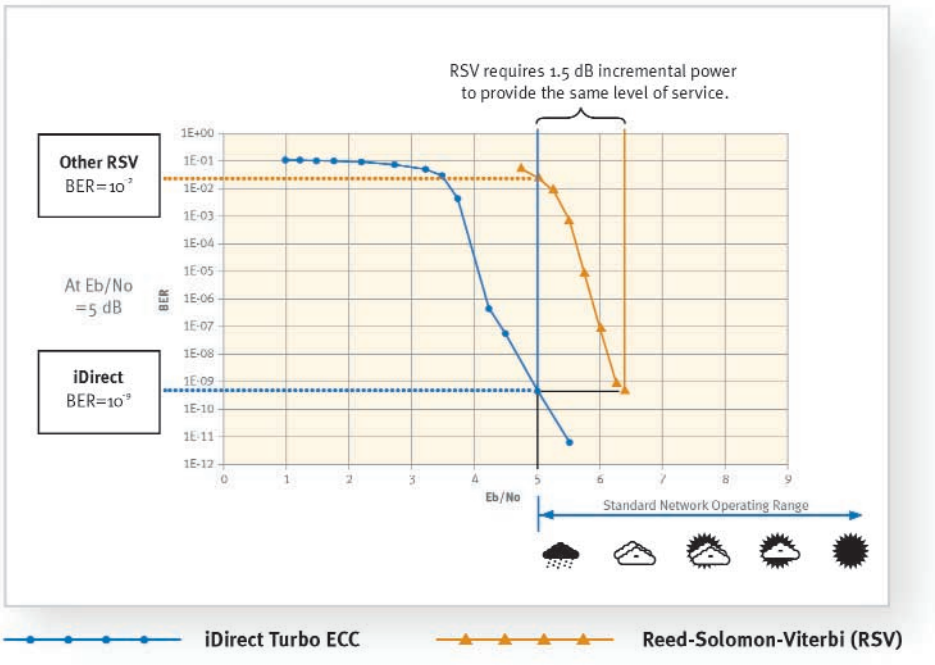
The iDirect Technologies Hub solutions offer an expanding portfolio of configurations that allow you to support a broad range of requirements and applications. No one in the industry provides the flexibility that iDirect offers relative to hub enablement.

iDirect 20-Slot 5IF Chassis is designed for network operators who offer service on multiple satellites. With the versatile 20-Slot 5IF Hub Chassis, you can access up to five satellites from one location, allowing you to cover a number of regions without purchasing and operating multiple hubs. The Chassis can support C, Ku, and Ka band transponders and features dual AC for carrier class redundancy.

iDirect 20-Slot 1IF Chassis is designed for network operators with full teleport capabilities provided over a single satellite. Like the 5IF Hub Chassis solution, our 20 slot 1IF chassis allows up-to 20 networks from a single hub, saving you invaluable collocation space.

iDirect Private Hub is a highly efficient solution for enterprises operating their own private networks, and smaller teleport operators. It is also a cost-effective way to replace more costly frame relay connections in enterprise networks. The iDirect Private hub supports non-teleport class outdoor electronics, and provides one inbound/outbound network capability.

iDirect Virtual Network Operator (VNO) is an ideal solution for non-facilities based providers of satellite services that desire to operate their own network. It allows multiple VNOs to operate on the same chassis, but retain the ability via partitioning, to manage and operate their own networks through separate network management capabilities. Each VNO's traffic is entirely segregated.

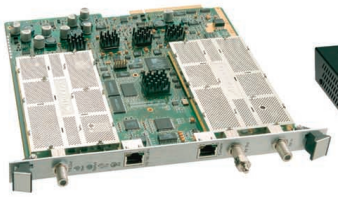



**Improved error correction means higher data rates and more efficient transponder usage**

This graph illustrates the significant increase in power savings delivered by iDirect Turbo ECC versus DVB using Reed-Solomon-Viterbi. At a power level of 5 dB Eb/No, the DVB system would be performing at a BER of $10^{-2}$, where the iDirect system would be at $10^{-9}$. A DVB system using RSV would need an increase of 1.5 dB to provide this same level of service. The iDirect solution delivers even greater gains, of more than 3 dB, when compared against other error corrrection techniques. These efficiency gains can be realized in a variety of ways, including increases in range, reductions in antenna size or reduced transmitter power and noise receive figures.

reliable

Hub Chassis



Universal Line Card


Private Hub

## TURNKEY HUB ENABLEMENT SOLUTIONS

**Complete turnkey Hub package**
The Hub Chassis solutions provide all the necessary equipment to implement the platform, including:

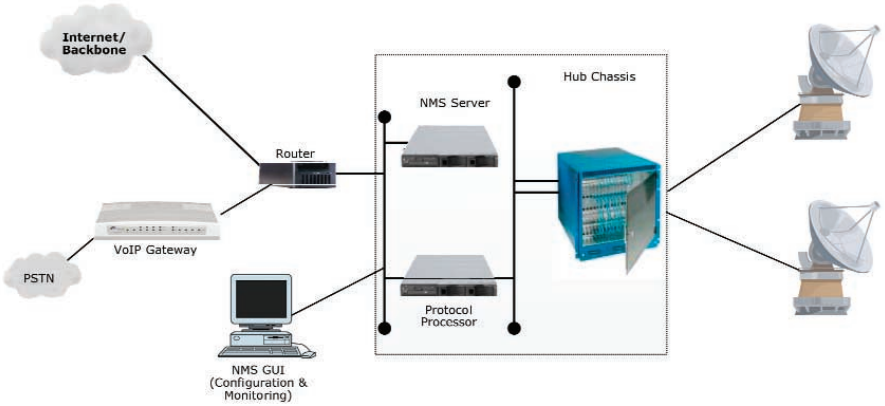
A rack-mounted chassis with 20 slots for iDirect Universal Line cards. The card design allows for higher density of routers per rack and easily expands on a per-router basis. The chassis configuration requires less power and generates minimal heat.

iDirect Universal Line Cards. Each D-TDMA card supports numerous sites and can be configured for inbound/outbound through the Network Management System (NMS). All Universal Line Cards utilize our superior technology to offer the highest bi-directional data rates and the most efficient use of bandwidth per transponder.

NMS. Provides industry leading visibility and control to all Hub Chassis and remote NetModem II *Plus* systems. Highlights of the NMS include:

- GUI based configuration and monitoring tools
- Proactive monitoring of operations
- Statistical reporting for trend analysis and service monitoring
- Over-the-network software downloads and equipment management
- Easy to use GUI interface access to "Global NMS" via SNMP forwarding

## INTERNET GATEWAY CONFIGURATION




Protocol processor. Conducts all of the TCP acceleration, QoS, TDMA management and dynamic time slot allocation for the multiple modem cards contained in the Hub Chassis.

Rapid implementation. iDirect Technologies provides everything you need to migrate legacy earth stations into broadband IP gateways, including design, configuration, installation, testing and activation of the Hub Chassis network.

Training. iDirect Technologies ensures that your team is fully trained and skilled in the use of our technology so you can achieve maximum results on the system. We provide a comprehensive training program that covers all aspects of VSAT and Hub installation, configuration, the NMS database and the NMS graphical user interface.

Support Services. iDirect Technologies also offers a suite of fee-based customer support and network monitoring services to augment your operations.

Technical Access Center (TAC) shadowing network support. Gives iDirect Technologies professionals visibility into the network provider's network and allows the iDirect TAC to operate as a backup system.

iDirect Technologies, a leader in enabling fast, reliable broadband IP access, has broken through the technology barrier to develop an advanced IP-over-satellite platform. Our Hub teleport solutions and NetModem II *Plus* broadband routers have emerged as superior solutions compared to those that implement IP networking on top of older SCPC or Video platforms.

Our broadband routers enable you to convert existing teleports into C-, Ku- or Ka-band IP gateways. Your investment will pay off in increased revenue by adding more customers to existing bandwidth, and in significant cost savings as you benefit from more efficient use of your bandwidth, thus lowering operating costs.

## DELIVERING BOTTOM-LINE BENEFITS

iDirect Technologies gives you a complete turnkey solution that helps lower equipment and operating costs while increasing revenues and profits. With a rapid time-to-market, you'll achieve a compelling return on your investment that delivers the highest possible quality to your customers.

Our technology enables Network Operators anywhere in the world to:

- Provide fast bi-directional satellite connections to the Internet with shared data throughput speeds up to 9.1 Mbps
- Support multiple customers and service levels on a single Hub Chassis
- Create multiple private IP networks providing flexibility in network design
- Improve reliability with fiber-quality bit error rates
- Increase market share, with minimal capital investment
- Support more users with a shared service model
- Economically expand your network to support incremental network growth
- Increase your service offerings with new IP applications such as multicasting and distance learning
- Easily build multiple outroutes from a single hub for an aggregate throughput of up to 180 Mbps

## EXCEPTIONAL PARTNERSHIP SUPPORT PROMISES SUCCESS

iDirect Technologies offers a premier, full-scale partnership program unmatched in the satellite industry. We have a deep commitment to helping you create a sustainable business model by providing products and services that add value – every step of the way. Whether you're generating new opportunities, installing a customer site or resolving a technical issue, iDirect will always be there with tools and resources to help ensure your success.

## TECHNICAL SPECIFICATIONS FOR THE 1IF-HUB CHASSIS

| | |
|---|---|
| Slots | 20 |
| Slot Groups | Minimum Group Size 4 Slots<br>Maximum Group Size 20 Slots |
| SatCom Interfaces | TxIF: Type-F, 950 - 1700 MHz<br>RxIF: Type-F, 950 - 1700 MHz<br>20-to-1 L-Band Combiner/Divider for Tx<br>20-to-1 L-Band Combiner/Divider for Rx |
| Management Interfaces | RJ45, Console Port on NetModem Cards<br>RJ45, 10/100 Ethernet on Chassis - Monitoring/Configuration |
| LEDs | Line Card Status, Power Status, Fan Status |
| Cable Management | 20 Port - RJ45, Cat5e Patch Panel UTP/STP |
| Size | W 19" x D 22" x H 17.4"<br>(W 48.26 cm x D 55.9 cm x H 44.2 cm) |
| Weight Empty | 75 lbs (34.1 Kg)<br>Loaded 103 lbs (46.7 Kg) |
| Operating Temperature | 0¼ to 45¼C (+32¼ to +113¼F) |
| Power Supply | N+1 Redundant (N=2)<br>Hot-Swappable<br>90-264 V~, 8A@110V, 47-63 Hz |
| Fan | N+1 Redundant (N=2)<br>Hot-Swappable |
| Standards Compliance | UL 1950, EN 60950, FCC Part 15 Đ Class B, EN 55022 ĐClass B, EN 300673, EN 61000-6-2, ISO 7779 |

## TECHNICAL SPECIFICATIONS FOR THE 5IF-HUB CHASSIS

| | |
|---|---|
| Slots | 20 |
| SatCom Interfaces | TxIF: Type Đ F, 950 Đ 1700 MHz<br>RxIF: Type Đ F, 950 Đ 1700 MHz<br>5 Independent, 4-to-1 L-Band Combiner for Tx<br>5 Independent, 4-to-1 L-Band Divider for Rx |
| Management Interfaces | RJ45, Console Port on NetModem Cards<br>RJ45, 10/100 Ethernet on Chassis Đ Monitoring /Configuration |
| LEDs | Line Card Status, Power Status, Fan Status |
| Cable Management | 20 Port Đ RJ45, Cat5e Patch Panel |
| Size | W 19" x D 22" x H 17.4 "<br>(W 48.26 cm x D 55.9 cm x H 44.2 cm) |
| Standards Compliance | UL 1950, EN 60950, FCC Part 15 Đ Class B 55022 - Class B, EN 300673, EN 61000-6-2, ISO 7779 |

## TECHNICAL SPECIFICATIONS FOR THE PRIVATE HUB

### NETWORK CONFIGURATION

| | |
|---|---|
| Network Topology | Star |
| Multiple Access | TDM (Downstream)<br>D-TDMA (Deterministic TDMA)<br>Multi-Frequency TDMA (Upstream)<br>Configurable number of Upstream Carriers per Downstream<br>Configurable frame length, (number of slots/frame) |
| Channel Rates | Outroute: 11.5 Mbps or 5.75 Msps<br>Inroute: 5.75 Mbps or 2.875 Msps |
| Channel Spacing | 1.2 |
| Modulation | QPSK |
| IP Data Rates | Outroute: 64kbps Đ 9.1Mbps<br>Inroute: 64Kbps Đ 4.2Mbps<br>(Max. of 1 Mbps @ 0.66 FEC and 4.2 Mbps @ 0.793 FEC) |
| FEC | Outroute: Turbo Product Coding (TPC) Rate 0.793<br>Inroute: TPC Rate 0.793 or TPC Rate 0.66 |
| Eb/No | 4.6 Eb/No for 10 ¯9 Quasi Error Free @ 0.793 FEC<br>5.4 Eb/No for 10 ¯9 Quasi Error Free @ 0.66 FEC |

### INTERFACES

| | |
|---|---|
| SatCom Interfaces | TxIF: Type-F, 950 - 1700 MHz<br>RxIF: Type-F, 950 - 1700 MHz<br>TVRO: Type-F, 950 - 1700 MHz |
| Data Interfaces | LAN: RJ45, 10/100 Ethernet<br>RS-232: RJ45 (for GPS or Console connection) |
| Protocols Supported | TCP, UDP, ICMP, IGMP, RIP Ver2, Static Routes, NAT, DHCP, DNS Caching, cRTP |
| Security | 3DES Link Encryption (optional) |
| Traffic Engineering | QoS (CBWFQ), CIR, Rate Limiting, Dynamic Allocation |

### MECHANICAL/ENVIRONMENTAL

| | |
|---|---|
| Size | W 11.75" x D 10.50" x H 1.75"<br>(W 29.9 cm x D 26.7 cm x H 4.5 cm) |
| Weight | 7 lbs (3.18 Kg) |
| Operating Temperature | 0¼ to 45¼C (+32¼ to +122¼F) |
| Input Voltage | 100-250 VAC Universal Input, 2A Max @ 100VAC |

## For more information contact: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