Satellite Division

FRAME RELAY SATELLITE IP PLATFORM SYSTEM OVERVIEW
Featuring the Metrodata PA1000 Satellite Gateway & IPricot IPR-S1110FR Satellite Router-Receiver

IPricot & Metrodata are partnering to offer a turnkey, efficient and cost effective satellite frame relay platform solution

Metrodata IPricot Frame Relay Solution

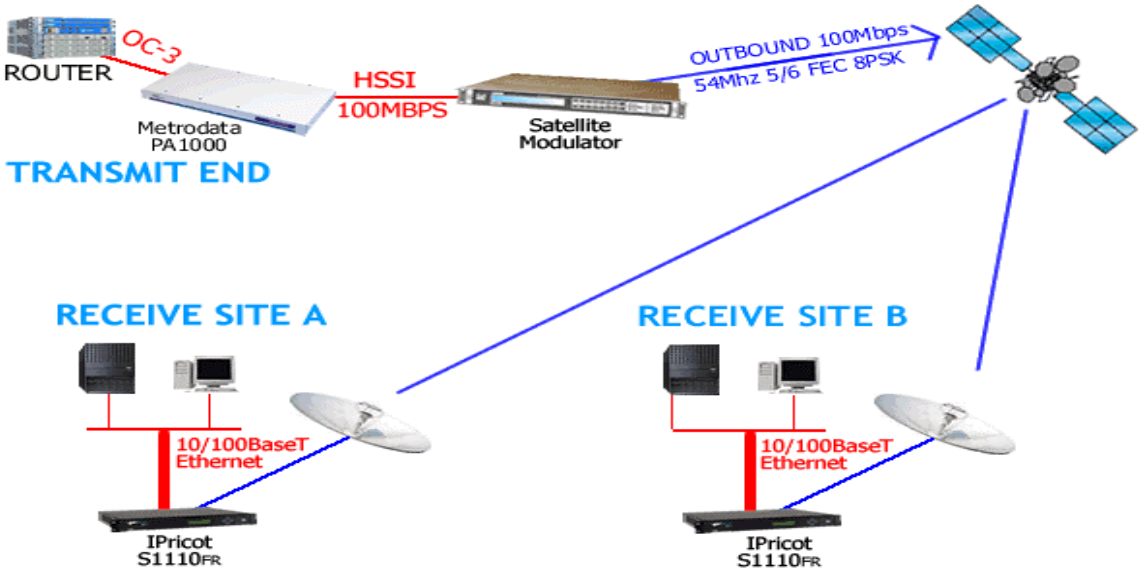
With the **Metrodata IPricot solution** you have the ability to increase sales, as you can optimise your existing transponders and saturate them with customers. Right now there may be thresholds in your network which mean you need to start another service on the next transponder or even launch another system.
With the **Metrodata IPricot solution** in your network you can potentially have sustained growth on an existing transponder. This is a particularly true when looking at high bandwidth bi-directional backbone links. Previously limits would be placed on the possible maximum bandwidth by the Routers at either end and not the Satellite architecture, transponder size or modulation technique.

In fact in many instances bandwidth was backed off to incorporate the speed that could be sustained on the Router HSSI interface.

It became apparent that the PA1000 could support some very high speeds, even in excess of 100Mbps.

HSSI Satellite Modulators from Newtecs Azimuth range were used to test the maximum throughput of the PA1000 up to 110Mbps.

If you could optimise the high speed backbones and increase the amount of bandwidth available, what about looking at other internet service platforms.
The most common of these seemed to be DVB/IP Outbound or Uni-Directional services. These seemed to be prevalent in the Industry, but with the high overhead of DVB/IP we wandered whether there was any way Metrodata could optimise the architecture. It didn't seem that there was, until we were introduced to the concept of using Frame Relay DLCI's instead of DVB/IP. This would immediately reduce the overhead and improve performance. The transmission of Frame Relay was transparent to the PA1000, and so we could transmit an optimal outbound carrier with reduced overhead.



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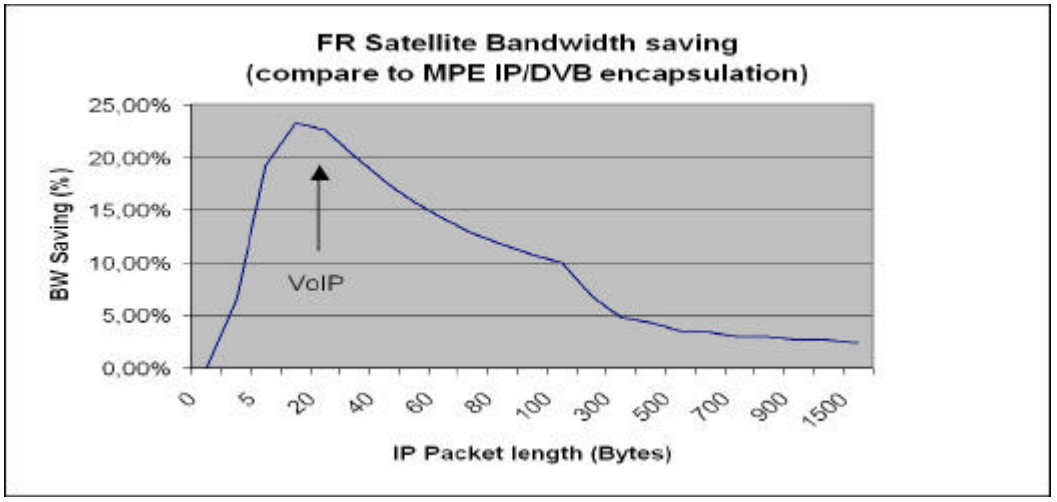
As can be seen on the graph below, a typical 20% bandwidth saving can be achieved for small packets compare to DVB/IP MPE encapsulation. This is particularly efficient for carrier transporting VoIP packets.



The **Metrodata IPricot solution** takes the best of DVB/IP and the best of Frame Relay and combines them together to give an optimized solution for pure IP delivery with reduced overhead

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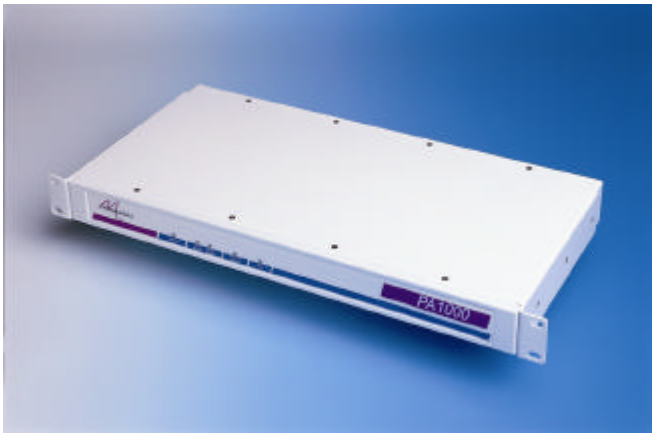
PA1000 SATELLITE GATEWAY

Frame Relay Satellite IP

Satellite Division

PA1000 OVERVIEW

The Metrodata PA1000 is a POS to HSSI Converter. It supports speeds up to 110Mbps, which is double the bitrate supported by Cisco HSSI Router Modules.



FEATURES:

- **Supports up to 110Mbps Outbound**
- **HSSI Satellite Modulator and Demodulators supported**
- **POS STM-1/OC-3 Fiber Module with Multimode SC as standard**
- **Single Mode Short Haul SC and Long Haul SC also available**
- **Bit Rates in 1bit increments**
- **Asymmetric, Simplex and Full Duplex data rates supported**
- **Point-to-Point, Point-to-Multi-point**

About PA1000

The Metrodata PA1000 Satellite Platform has evolved out of customer requirements for interfacing High Speed Satellite Links to Routers. Due to its flexibility and scalability the PA1000 makes a perfect choice upon which to base your Satellite Infrastructure.

The Metrodata PA1000 provides a gateway to using optimal Frame Relay Encapsulation on Outbound IP Over Satellite services.

Utilising the Metrodata PA1000 will allow you to re-design, optimise and transform your satellite network. You can design truly innovative satellite services, as Metrodata give you a platform to use your imagination. With the Metrodata PA1000 you have a platform for building a lasting competitive advantage, because you can remove the thresholds placed on YOUR Service Delivery, by YOUR infrastructure.

Metrodata Satellite Division are at the leading edge of Satellite Communications, working with Telecoms and Satcoms Hardware Manufacturers to develop a truly scalable and flexible Core Platform for satellite service delivery.

Metrodata are offering you the opportunity to turn our product innovations into new, exciting and profitable services.

There has always been an invisible demarcation point between Telecoms Knowledge and Satcoms Knowledge. This is not just a knowledge barrier, but a hardware barrier as well. Most of the thresholds placed on your service delivery, come from your Satcoms and Telecoms Infrastructure. With the Metrodata PA1000 Platform you can remove these thresholds and build truly scalable solutions, whilst drastically simplifying your network infrastructure.

BENEFITS OF THE PA1000 INCLUDE:

- VARIABLE BIT-RATE FROM 8K TO 100MBPS
- EASE OF MIGRATION FROM EXISTING HSSI BASED ARCHITECTURES
- REDUCED OVERHEAD COMPARED TO DVB-IP SYSTEMS
- BOTH ASYMMETRIC, FULL DUPLEX AND RECEIVE-ONLY SERVICES SUPPORTED

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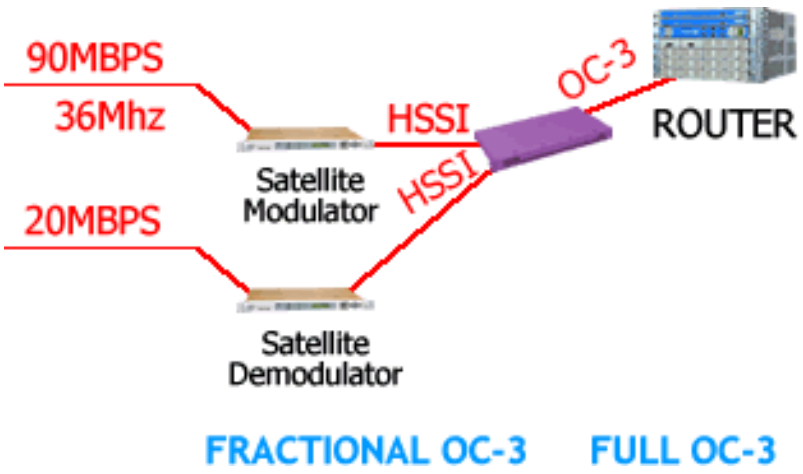
The PA1000 has continually evolved as we developed it. As satellite service providers thought of new and additional features we still kept all the original functionality
The initial requirement was for a device that could interface a HSSI (High Speed Serial Interface) to any backbone Router. With the Cisco HSSI interface having a maximum rate of 51.84Mbps

HSSI router interfaces only operate up to 51.84Mbps - the PA1000 extends the speed capability of the Satellite modems HSSI Interface to operate at 90Mbps, and interface them to an OC-3 155Mbps router. The PA1000 dramatically increases the flexibility and longevity of the satellite link bandwidth - that's 80% more throughput, and/or a major deferral of the need to launch new satellites for additional capacity - $m's potential savings.



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IPR-S1110FR

Frame Relay Satellite IP Router Receiver

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IPR-S1110FR OVERVIEW

FEATURES:

- **Receiving any QPSK, 8PSK, 16QAM, 2-45 Msymb/s carrier**
- **De-encapsulating the Frame-Relay data based on the customer DLCI channel allocation**
- **Forwarding the extracted data directly on the customer LAN through its 10/100 BaseT Ethernet/ Fast Ethernet port**
- **Minimizes protocol overhead, allowing you to improve your bandwidth efficiency and reduce the overall cost of your satellite platform (up to 20% saving)**
- ***The IPR-S1110FR has been tested and validated with an existing satellite operator platform.***

About IPR-S1110FR

The **IPR-S1110 FR** is a brand new Frame Relay integrated satellite router receiver designed to receive the outbound carrier at the distant site at a very competitive price.
This new Frame Relay solution is offering a number of key advantages:

It takes the best of the 2-Way DVB platforms for Point to Multi-point platform enabling Assymetric IP services tailored to your need

You don't need an expensive redundant DVB/IP gateway or encapsulator, to offer carrier class IP backbone services

It minimizes protocol overhead, increasing the bandwidth efficiency and therefore reducing the overall satellite cost (especially for small VOIP packects)

Finally The IPR-S1110 FR is offering an all in one solution for the reception and data forwarding of the outbound channel at a very cost effective price.

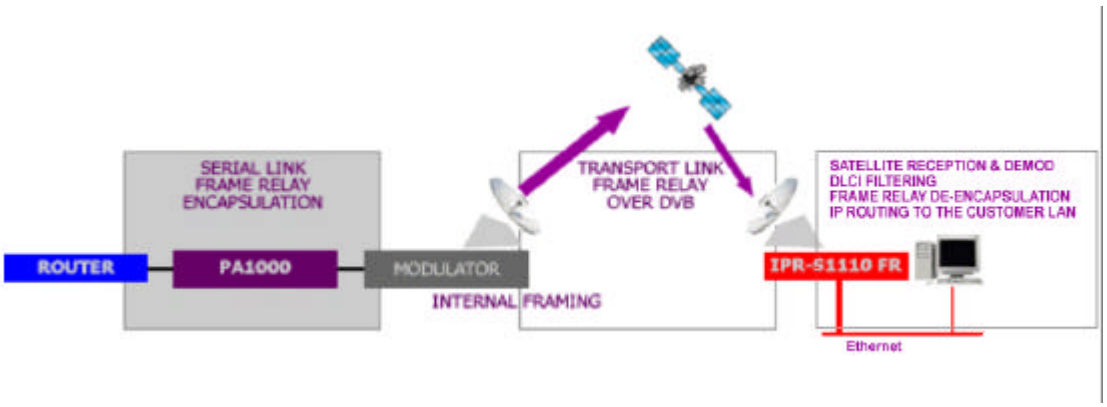
Capability
- Unicast, Multicast, Broadcast Routing or Bridging (Static, IGMP, DVMRP, NAT Dynamic)

Performance
- QPSK 8PSK 16QAM modulation, 2-45 Mbauds
- Satellite interface up to **145** Mbit/s of data
- Up to **100 Mbit/s** throughput for 1500 Bytes IP packet length per unit
- Up to 20 Mbit/s throughput for 64 Bytes packets

Reliability
- Additional processor for watchdog control
- No on-board mechanical components
- Telecom quality grade

Manageability
- Return channel management via router, modem, PPP or PPTP
- Easy integration within any existing architecture (no third party software needed)
- Easy to install & set-up
- Management & monitoring through LCD display & key pad, console, telnet, web, SNMP
- Management of configuration profiles

Scalability
- Complete list of optional software packs for differentiated services offering
- Exclusive flash card embedding OS, software & profiles



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PA1000 Specifications

HSSI Port

Interface Type:	HSSI
Connector:	50 Way Miniature AMP (SCSI-2)
Mode:	DCE-DTE
Data Rate:	DCE Mode 51.84Mbps DTE Mode up to 90Mbps DCE Supplied Clock
Framing Mode:	HDLC (bit mode)
Max Packet Size	4096bytes
Flags	Supports back to back frames,
	1 flag between frames

Fibre Port

Interface Type:	Fibre
Connector:	Duplex SC
Fibre Type:	Multi-Mode, Single Mode Short Haul
	Single Mode Long Haul
Data Rate:	155Mbit/s per G.957
Payload:	HDLC (Byte Mode)
Max Packet Size	4096bytes
Flags	Supports back to back frames,
	1 flag between frames

Compliance and Approvals:

Safety:	EN41003, EN60950
EMC:	EN55022, EN50082

Power Supply:

AC Power Supply	100-250 VAC, 50-400Hz, 0.25A, IEC
DC Power Supply	-48V DC

Environmental:

Temp:	0-35 degrees C, 0-95% RH, Non-condensing
Pressure:	86kPa-106kPa

Packaging:

Type:	1U 19" Rack Mount
Dimension:	(WxDxH)
Overall:	436x213x48mm
Dimensions without feet:	436x213x44mm

PA1000 Ordering Information

Power Supply	**100-250 VAC**	**-48V DC**
PA1000 MM POS - HSSI Converter	80-05-530	80-21-510
PA1000 SM SH POS - HSSI Converter	80-05-531	80-21-511
PA1000 SM LH POS - HSSI Converter	80-05-532	80-21-512

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IPR-S1110FR Specifications

General Features
19" Rackmount
DVB Compliant
Universal LNB Compatible / US / Asia LNB
C-Band / Ku-Band / L-Band
Replaceable Flash Memory Containing Embedded Software & OS
Easy OS Update in Flash Memory
High Reliability via Watchdog Control
Ability to Embed Private Applications

Tuner
Input Frequency : 950 - 2150 MHz (L-Band)
Input Impedance : 75 Ohms
Connector : F-Type
LNB Power Supply : 14/18V/OFF, Max 400 mA
Over Current & Short Circuit Protection
Band Switch Control using 22 KHz Signal

Demodulator
QPSK 8PSK 16QAM
Symbole Rate : 2 - 45 Mbauds
Outer Decoder Reed Solomon (204, 188)
Deinterleaver Convolutional (Depth 12)
Including Spectral Inversion Ambiguity Resolution
Forward Error Correction (Automatic Detection)
Viterbi Code Rate 1/2, 2/3, 3/4, 5/6, 7/8
Nyquist Baseband Filters
Automatic Frame Synchronization
DVB-S Descrambler

Frame Relay
FR IETF Encapsulation
Up to 4 DLCIs Hardware Filtering
FR FCS Hardware Processing
IP over FR Unicast Routing
Up to 100 Mbit/s Sustained

Physical Interfaces
LCD Front Panel (20 characters x 2) Display and Keypad
LED Indicators (Unlock, Status, LAN, Power)
Signal RS-232, Max 115.2 Kbit/s (Serial 9-Pin D-Sub (Male))
Console Port
Ethernet 10BaseT & Fast Ethernet 100BaseT (Network RJ45)

Management Interfaces
Multiple Remote Control and Management Interfaces :
SNMP LCD Display & Key Pad
Web Interface Telnet
Dedicated Console Port

Routing
Unicast, Multicast, Broadcast Routing or Bridging
(Static, IGMP, DVMRP, NAT Dynamic)

IP Protocols
Fully IPv4 Compliant (RFC 791, 792, 919, 922, 950, 1112)
Fully UDP Compliant (RFC 768)
Fully TCP Compliant (RFC 793)

Tuner Settings
Frequency / Polarization / Baud Rate / FEC (Manual or Auto)
LNB Type / Voltage / Power Tuning & Scanning Frequency

Monitoring :
VBER / CBER * Total IP Packets & Bytes
Digital Level / Eb/No Lock & Status
Symbol (Baud) Rate Temperature
IP (Data) Rate

Settings & Controls
Profile Management (Save / Restore / Delete)
Up to 32 Profiles on FlashCard
Firmware Management (Load / Backup / View Contents & Versions)
HTTP & TFTP Load and Backup of Firmware & Profiles
Read & Write Passwords for all Interfaces
IP Address & Mask / ICMP Redirect / Date & Time / System Reset / ...

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