

# Kromos iP<sup>3</sup> System Specifications

## INTRODUCTION

The Kromos iP<sup>3</sup> Gateway is a carrier-grade native IP solution for transport of IP data, Voice-over-IP (VoIP) and multi-media traffic such as video via satellite. The iP<sup>3</sup> is a satellite router that intelligently combines IP Routing, TCP/IP acceleration, Satellite Modem, Frequency Agile Bandwidth Aggregation, DAMA and advanced Monitoring & Control (M&C) capabilities in one single platform. In addition, the iP<sup>3</sup> provides the scalability, flexibility, bandwidth optimization and priority for voice, video & real-time applications. In short, the platform allows users to adapt quickly to dynamic market conditions without replacing or re-engineering the satellite IP platform.

## Configurations

The iP<sup>3</sup> Gateway consists of a rugged chassis with a 10/100 Ethernet interface, a flexible/configurable assortment of plug-in satellite modulators, demodulators and other modules for various functionalities.

iP<sup>3</sup> Chassis are available in 2 configurations:

- **HS 2000:** This product is targeted toward Hubs and other sites with several inbound or outbound carriers. This unit has 13 available slots. One unit can support up to 70 remotes. The network can be expanded by adding more units in the same Ethernet segment.
- **LS2002:** This is a 2-U chassis targeted towards remote locations that require a cost-effective, high-performance unit. This unit has 4 available slots and can be used as a **mini-hub** for a network of up to 20 remotes.

Modulator Demodulator cards are available in both 70 MHz and L-Band IF. They support variable data rates from 16 to 5,000 kbps per card (15 Mbps total per chassis). The units also have Concatenated coding with Reed-Solomon (L-band only) and Viterbi forward error correction (FEC) to combat channel errors. The system supports **point-to-point, Star, Full-Mesh** or an arbitrary combination of these network configurations.

The iP<sup>3</sup> runs on reliable **Linux** operating system with its built-in support for IP networking. Several additional features e.g. TCP acceleration over satellite, priority for voice/video, software drivers for the various third-party products come with the **ONE BOX** solution. The also has an advanced suite of Network Management Features with web interface, SNMP, Telnet and dial-up modem access.

## KEY STANDARD FEATURES

- 10/100 Ethernet interface, Plug-N-Play support for most COTS hardware (e.g. Wi-Fi, IP Video etc)
- Routing
- Frequency Agile 70 MHz or L-band modems
- Prioritized Queuing for Voice over IP, Video and other real time applications.
- Powerful network management – Kromos provides an optional **Centralized NMS** platform. However, each unit has built-in NMS features consisting of
  - SNMP with MIB
  - User friendly Web Interface
  - Telnet locally or remotely (both in-band or out of band control)
  - Control of ODU through IF cable (FSK), if supported by ODU
  - **Dial-up modem provides out-of-band NMS even when satellite link is down**
- Remote software/firmware upgrade
- Data rates 16 kbps to 4096 kbps per 70 MHz card (64 kbps to 5.0 Mbps for L-Band). Total 15 Mbps per chassis.
- **TCP Acceleration** - The IPmax protocol mitigates all drawbacks of TCP/IP over satellite and provides throughput that is similar to that of terrestrial links. Features such as efficient retransmission, adjustable window sizes etc maintain high throughput even in channels with high BER. This protocol is completely transparent to all TCP/IP applications.

## OPTIONAL FEATURES

- **DAMA** - DAMA allows any iP3 terminal in a network to set-up/tear-down carriers of desired bandwidth on demand while staying silent when no transmission is required. Enables optimal bandwidth usage among a large number of terminals.
- **Bandwidth Aggregation** - The bandwidth aggregation feature allows multiple carriers (placed anywhere in the transponder) to be launched/ taken down from the iP<sup>3</sup> **on the fly**. This allows the user to either increase or decrease bandwidth in response to varying data rate requirements. These additional carriers can be placed wherever there is room in the transponder and need not be contiguous in frequency. Hence the satellite service provider does not need to relocate or disrupt existing customers to accommodate new carriers. These individual carriers can even be on **different transponders or even different satellites**. From the data side these carriers appear as one contiguous pipe. Together with DAMA, this feature provides the most dynamic allocation of bandwidth on an **“as needed”** basis.
- **AUPC** – Automatic Uplink Power Control to compensate for fade due to rain or other factors.
- **VoIP Gateways** – Complete VoIP solution e.g. **VoIP Gateways, custom dialing, CDR support** etc. Works with **inexpensive analog phones** (no need to purchase expensive IP phones). Supports all coding schemes e.g. G.711, G.723, G.729a, G.723r53 etc with variable frame sizes. Provides extremely good quality voice at lowest data rates.
- **Kromos IP Softswitch** – The Kromos Softswitch provides a number of IP PBX functionalities (**custom greeting, call routing, call setup/termination, billing info etc**) at a fraction of the cost of traditional PBXs. This platform can be used to connect regional offices through a VPN or dedicated IP pipes, act as a media gateway/gatekeeper (SIP, H.323 traffic). Soft-switching also provides an efficient way to upgrade network to the latest technology without changing the hardware. Being an intelligent IP device, the Softswitch can provide **fire-walling** to keep unwanted traffic (e.g. sales calls, solicitations etc) away, while **blocking calls** to certain numbers from the intranet.

- **TANIE (TCP Acceleration for Non-Homogeneous IP Environment)** - TANIE is an application that provides a mechanism to accelerate TCP traffic going through non-Kromos hardware **also**, provided that one of the data paths (say return channel) is through iP3 gateways.

**Other Key Optional Features**

- Highly Stable integrated 10 MHz reference unit for L-band
- Power supply for ODU
- DC Power, 10 MHz reference and FSK based M&C up the IF cable, M&C support for Third Party Transceivers/BUCs
- M&C Support for Outdoor Units
- Dial-up Modem for out of band control
- Intelligent Lossless Combiners and Dividers in the Chassis for L-band multi-carrier operation

## Detailed Specifications

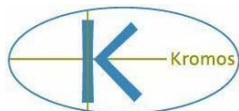
OS	Linux
Key Features	IPMax – TCP Acceleration, AUPCDAMA, Bandwidth Aggregation, Priority for VoIP/Video/Multi-media, TANIE, , Web Server
Network Management	SNMP, Web, Telnet and v.90 dial-up access via PSTN for out of band Telnet, M&C Support for third party Outdoor Equipment
Hub	Expandable Hub with “Pay as you grow” architecture
Power Supplies	Redundant/Hot Swappable (HS2000 Only)
Cooling	Hot Swappable Fans in HS2000 Chassis

Operating Conditions	+5 to +45° deg. C amb. To 95% humidity non-condensing
Storage Temperature	-25 to + 85 deg. C. amb

	<b>LS2002</b>	<b>HS2000</b>
Transmit/Receive Card Slots	3	14
Dimensions	18.9”x19”x3.5”	26.5”x19”x7”
Power Consumption	90W	125W



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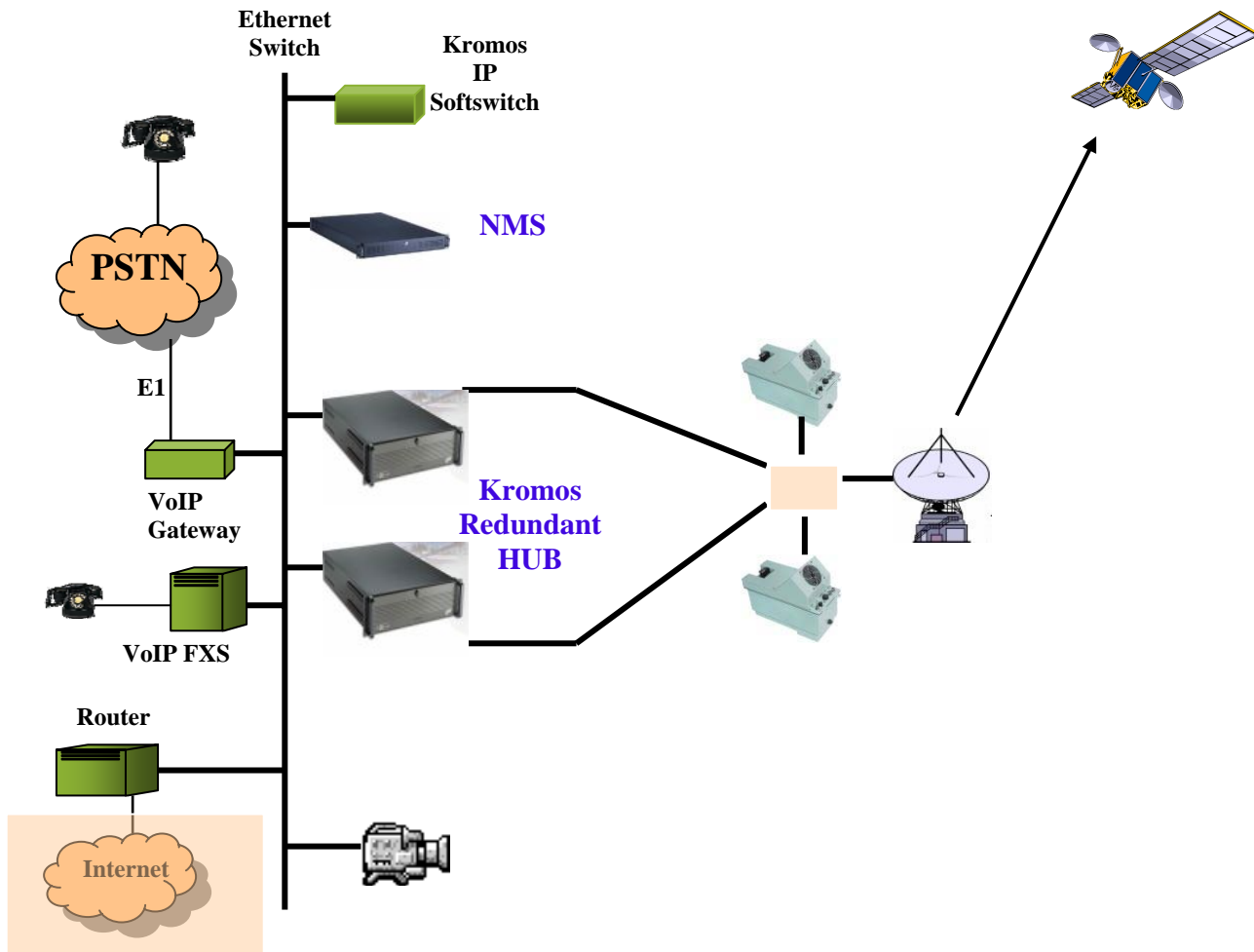
[www.kromos.com](http://www.kromos.com)

# Additional Hub Features (all features in one Box)

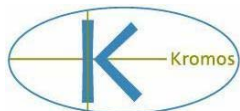
**Geographic Redundancy** - This feature provides complete failsafe switchover to a redundant Hub placed elsewhere in case the Primary Hub either fails or is rendered non-functional due to natural or man made disasters. The switchover from Primary to Secondary is automatic. The Kromos Hub redundancy system is unique in the industry in the sense that no broadband connectivity is required between the two Hubs. The satellite channel is adequate to facilitate this switchover. The switchover can also be implemented for redundant Hubs co-located with the Primary Hub. The entire system is managed by the built-in tools for Monitoring & Control that come with the Kromos Equipment.

**Hot Swappable Power Supply & Fans** - The Kromos Hub comes with 1+1 hot swappable power supplies to ensure uninterrupted operation of the Hub in case one of the power supply modules fail. The defective unit can be replaced with a new one without turning OFF the unit. The system also comes with three hot-swappable cooling fans. The system only needs one for normal operation.

**DAMA Monitor** - This utility manages the frequency allocation for the entire network in case of DAMA operation.



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