

## Stream Processing Platform for Multiplexing and Scrambling

HIGHLIGHTS

- Compact, modular 1-RU system with 5 I/O slots
- Gigabit Ethernet (GbE) I/O module, 2 independent GbE ports per module
- ASI I/O module, 4 ASI ports per card
- Native IP scrambling and multiplexing
- ASI scrambling and mirroring
- Integrated ProCipher scrambling technology, the fourth generation of Harmonic's scrambling solution based on 12 years of expertise
- AES scrambling algorithm
- ASI and IP aggregation capabilities
- Remultiplexing of any service from any input to any output
- MPEG-2 TS or RTP/UDP over IP output
- Controlled via NMX Digital Service Manager™
- Forward error correction
- GPS receiver for SFN over IP transmission

The ability to deliver multiple services to a variety of devices—including television sets, PCs and mobile devices—is becoming a necessity in order to provide viewers with a richer experience. At the same time, the architecture must be cost-effective, reliable and highly efficient.

Designed to address the increasing demand for advanced video and audio services Harmonic's ProStream™ 1000 stream processing platform with ProCipher™ technology is an ideal solution for multiplexing, scrambling, re-encoding and statistical multiplexing of MPEG streams. The ProStream 1000 is a modular 1-RU system with five rear panel slots which can be populated with ASI or IP (Gigabit Ethernet) cards.

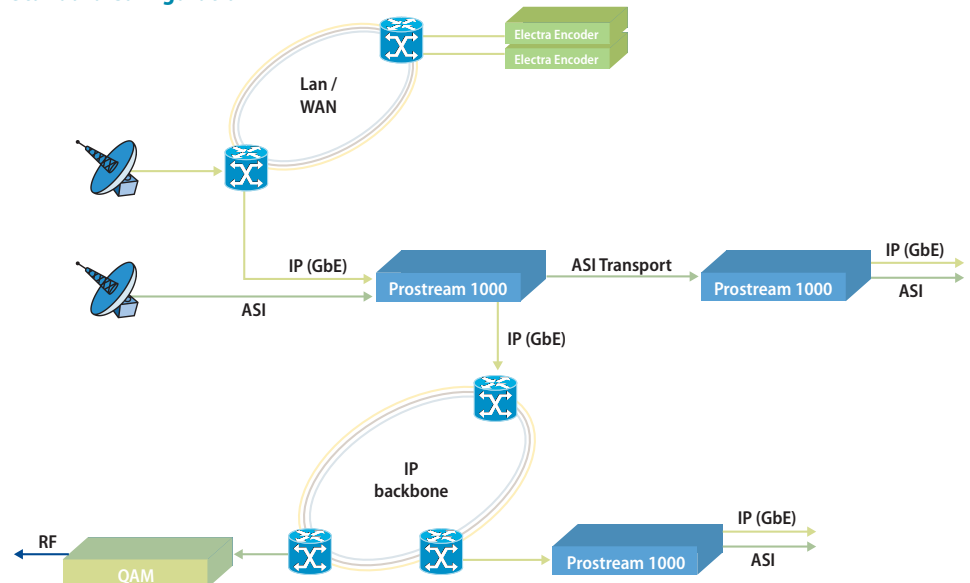


With its standard IP and DVB-ASI input and output interfaces, the ProStream 1000 can be easily incorporated in any existing headend environment and support any digital turnaround architecture. The ProStream 1000's robust, extensible and highly scalable design supports MPEG re-multiplexing functionality, including PID remapping and filtering, insertion of PSI/SI tables, PID multicast, service redundancy as well multiple IP sockets containing MPTS and SPTS. This configuration not only reduces rack space and power requirements,

but also simplifies network infrastructure while delivering a high-availability solution.

Three IP 100Base-T Ethernet interfaces are available for connection to the Conditional Access System (CAS) as well as to the management and control network. Through the CAS IP interface the ProStream 1000 communicates with the ECMGs and EMMGs for exchange of control words, ECMs and EMMs.

### Standard Configuration



- DVB scrambling
- IPTV scrambling
- IP networking of Broadcast Video
- Advanced Remultiplexing
- Digital Turn Around
- Centralized and Remote Statistical Multiplexing

The ProStream's industry-leading SimulCrypt Synchronizer core (SCS) supports DVB SimulCrypt versions 1, 2 and 3, and allows for the simultaneous connection of up to ten different CAS from different vendors.

Fully integrated with all leading CAS vendors and compliant with widely implemented industry protocols, the ProCipher scrambling technology is known in the industry for its stability, and high performance.

The ProStream 1000 with ProCipher IP and ASI scrambling technology is designed to multiplex and scramble any format of video, audio and data elementary streams (e.g. MPEG-2, MPEG-4 AVC, AC-3, AAC, AACPlus). The solution easily integrates into existing or new architectures, and reduces cost and complexity by eliminating the need for multiple devices or software-based IP scrambling solutions in distributed cable, satellite or telecom networks.

A DiviTrackIP engine enable the ProStream-1000 to support Statistic Multiplexing over LAN and WAN networks, including support for up to 24 services per statistically multiplexed pool and support for up to three pools within a single transport stream.

Unequalled performance and highly accurate bit-rate controlling, enable the ProStream 1000 to distribute MPEG traffic for Single Frequency Networks (SFN) from one central Headend, over an IP network, to multiple remote DVB-T SFN Headends

### Management

Through a local management interface Harmonic's NMX Digital Service Manager™ controls the primary and backup ProStream units in a redundant architecture. Together with NMX, the ProStream supports 1:1, N:1 and N:M redundancy schemes.

### Benefits

- **Multi-functional stream processing –**  
The operator can use the ProStream 1000 for a variety of stream processing manipulations such as multiplexing, scrambling, digital-encoding and statistical multiplexing over IP networks.
- **Flexibility –** All IP and ASI conversion options are natively supported, and the system delivers outstanding multiplexing and scrambling performance.
- **Support for all-IP infrastructure -** The ProStream platform's native IP interface seamlessly integrates into scalable, low-cost IP networks.
- **Network management -** Harmonic's NMX Digital Service Manager simplifies mass configuring, monitoring and automated redundancy in both centralized and distributed architectures.

### Gigabit Ethernet Card

Type	Gigabit Ethernet 802.3z
IP Ports	2 independent ports
Connector	2 x SFP (multi mode, single mode, copper)
I/O Speed	1 x 1000 Mbps per port
IP Encapsulation	MPEG TS over UDP/IP/MAC 1 to 7 TS/IP
MPEG Format	188 B per TS
MPEG TS	MPTS and SPTS
I/O Processing	Up to 128 sockets Up to 410 Mbps per card
Maximum Bit-Rate Per Socket	80 Mbps
Addressing	Unicast and multicast
Management	IGMP, ARP, ICMP
Forward Error Correction	ProMPEG FEC COP3

### ASI IO Card

Type	ASI input/ output
Connector	4 x BNC, 75W
I/O Direction	Configurable, input or output, per port
MPEG Format	188/204 B per TS
I/O Processing	1 MPTS/SPTS per port Up to 160 Mbps per port
ASI I/O Ports	4 to 20 (Each ASI card has 4 ports)
Mirroring	Any port to any port (on the same card)

### Management Interfaces

Ethernet	100BaseTX
Connector	3 * RJ-45 (1 Management, 1 CAS and 1 not used)

### Re-Multiplexing

Routing	Any Input to Any Output
Redundancy	1:1, N:M, HHP Input service redundancy Socket redundancy IP port redundancy
PID	Re-mapping, filtering, multicasting
PID Multicasting	Any Input PID can be multicasting to multiple TS outputs with different remapping and processing (different CW if scrambled)
PSI/SI, PSIP	Extraction, injection, spooling

### Scrambling

SCS	Internal
Standards	DVB scrambling, Open CAS DVB simulcrypt version 3. Stream server Divicom 1.4 AES scrambling algorithms
CAS connections	Simultaneous connections to 10 different Conditional Access Systems from different CA vendors
Number of ECMs	256 ECMs per platform

### Management

NMS	NMX Digital Service Manager
Protocols	TCP/IP

### Power/Physical

Input Voltage	85-264 VAC -48 VDC
Line frequency	47-63 Hz
Cooling	Inhale: Front. Exhale/ Exhaust: Right.
Power Consumption	110W – 220W
Rack Space	1 RU
Dimensions	4.45 cm x 48.26 cm x 60.69 cm (1.75 x 19 x 24) (H x W x D).

### Environmental

Operating Temperature Range	0° to 50° C 32° to 122° F
Storage Temperature Range	-40° to 70° C -40° to +158°
Relative Humidity	0 to 95% non-condensing
Operating Altitude	Up to 4,572 meters (15,000 feet)
Storage Altitude	Up to 12,192 meters (40,000 feet)

### Compliance Regulatory

Emission	EN55022/CISPR 22 Class A EN61000-3-2:1995 = A1:1997 + A2:1998 EN61000-3-3:1995 FCC 47 CFR part 15 Class A
Immunity (Radiation)	EN50082-1:1997 EN55024
UL/ ES (Electrical Safety)	EMC compliant to EU directive 89/336/EEC and 47 DFR part 15, subpart B Safety compliant to low voltage directive 72/23/EEC and 50083-1 standard EN 60950 (EC), UL 60950 (USA/ Canada)
ROHS	DIRECTIVE 2002/95/EC

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