Designed to address the increasing demand for advanced video and audio services, Harmonic’s award-winning ProStream® 1000 stream processing platform is an ideal solution for multiplexing, scrambling, re-encoding and statistical multiplexing of MPEG stream.

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 remultiplexing functionality, including PID remapping, prioritizing and filtering, insertion and generation of PSI/SI tables, PID multicast and port, socket and 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.

**Conditional Access**
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 30 different CAS from different vendors. The ProStream 1000 also supports AES encryption technologies for scrambling and de-scrambling applications.

Fully integrated with all leading CAS vendors and compliant with widely implemented industry protocols, the ProStream 1000 scrambling technology is known in the industry for its stability, and high performance.

The ProStream 1000 IP and ASI scrambling technology is designed to multiplex, re-encode SD MPEG-2 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.

**Statistical Multiplexing**
A DiviTrackIP™ engine enable the ProStream 1000 to support statistic multiplexing over LAN and WAN networks, including support for up to 64 services per statistically multiplexed pool and support for up to 16 pools per platform and three pools within a single transport stream.

By employing the VBR re-encoding technology, the “statmux in a box” DiviTrackMX™ engine enables the ProStream 1000 to increase bandwidth efficiency with minimum effect on video quality.

### HIGHLIGHTS

- Compact, modular 1-RU system with 5 I/O slots
- Up to 2 Gigabit Ethernet (GbE) I/O modules, 2 independent GbE ports per module
- Up to 5 ASI I/O modules, 4 ASI ports per card
- ASI/IP scrambling and mirroring
- Integrated scrambling technology, the fifth generation of Harmonic’s scrambling solution based on 14 years of expertise
- DVB and AES scrambling algorithm
- Internal EIS for SCG configuration
- ASI and IP 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™ and standalone web interface
- Forward error correction
- Slate insertion for service disruption message
- MPEG-2 SD re-encoding
- Digital program insertion for splicing and local ad insertion
- Statistical multiplexing
- Deterministic remultiplexing for distribution and local program replacement in DVB-T SFN distribution
- DVB-EIT/PSIP table regeneration
**IP Distribution**
As major cable and telco MSOs migrate to centralized content aggregation, the ProStream 1000 offers a solution for MPEG distribution over IP. The ProStream 1000 supports bulk scrambling and de-scrambling and enables secured content distribution by acting as the scrambler at the central headend and the edge descrambler at remote headends.

Controlled by Harmonic’s distribution management system DMS, the ProStream 1000 enables blackout switching applications for different sites and zones.

**SFN Distribution**
Unequalled performance and highly accurate bit-rate control enable the ProStream 1000 to distribute MPEG traffic for single frequency networks (SFN) from one central headend, over an IP network, to multiple remote DBT-T SFN headends.

The ProStream 1000 utilizes unique deterministic SFN remultiplexing (DSR) technology for dramatic reduction of distribution network bandwidth with regional program replacement in DVB-T SFN broadcast. By using the DSR, the local regional programs are synchronously included in the SFN multiplex at each transmitting site, avoiding the need for full multiplex regional retransmission.

**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.

**Stand Alone GUI**
ProStream 1000 is controlled via intuitive and user friendly GUI. The GUI is HTML-based and supported by Microsoft Internet Explorer.

**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.

**Applications**
- DVB scrambling
- IPTV scrambling
- IP networking of broadcast video
- Advanced remultiplexing
- Digital turnaround
- Centralized and remote statistical multiplexing
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 TS
MPTS and SPTS
I/O Processing
Up to 128 Sockets.
Up to 520 Mbps per card
Maximum bit-rate per socket
80 Mbps
Addressing
Unicast and Multicast
Management
IGMPv1, IGMPv2, IGMPv3, ARP, ICMP
Forward Error Correction
SMPE 2021-1 and SMPE 2021-2

ASI IO CARD
Type
ASI Input/ Output
Connector
4 x BNC, 75Ω
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 180Mbps per port
ASI I/O Ports
4 to 20 (Each ASI card has 4 ports)

MANAGEMENT INTERFACES
Ethernet
100BaseTX
Connector
3 * RJ-4S (1 Management, 1 CAS and 1 not used)

REMULTIPLEXING
Routing
Any Input to Any Output
Redundancy
11, 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
Output Mirroring
Any to any [ASI/IP to ASI/IP]
Advanced Stream Processing
Intelligent Service Substitution, PID Prioritization, PCR Generation, PID range

COMPLIANCE/REGULATORY
Emission
EN55022/CISPR 22 Class A
EN61000-3-3:1995
FCC 47 CFR part 15 Class A
Immunity (Radiation)
EN50082-1:1997
EN50024
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 EN60950 (EC)
UL 60950 (USA/ Canada)
RHOS
DIRECTIVE 2002/95/EC

STANDARD STAGING/SCRAMBLING
SCS
Internal
Standards
DVB Common Scrambling
Open CAS
DVB Simulcrypt Version 3.
Stream Server Divicom 1.4
AES-256, AES-NSA2
Scrambling algorithms
CAS connections
Simultaneous connections to 30 different Conditional Access Systems from different CA vendors
Number of ECMs
900 ECMs per platform

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

ENVIRONMENTAL
Operating Temperature
32° to 113° F / 0° to 45° C
Storage Temperature
-40° to +158° F / -40° to 70° C
Relative Humidity
0 to 95% non-condensing
Operating Altitude
Up to 15,000 feet (4,572 meters)
Storage Altitude
Up to 40,000 feet (12,192 meters)