HIGHLIGHTS

- Compact, modular 1-RU chassis with five IOM slots
- IP and DVB-ASI I/O, 8VSB input
- Multiplexing and scrambling of up to 500 simultaneous SD and HD broadcast services
- DiviTrackIP statistical multiplexing with remote distributed encoders
- Linear ad splicing into MPEG-2 and MPEG-4 AVC SD/HD video streams
- Advanced remultiplexing
- DVB and AES scrambling algorithms
- Dual power supplies
- Controlled via NMX Digital Service Manager and stand-alone web GUI

The latest evolution of Harmonic’s market-leading ProStream® stream processing platform, the high-density ProStream 9100 is an ideal solution for multiplexing, scrambling, descrambling and statistical multiplexing of SD and HD MPEG video. The compact 1-RU system delivers the flexibility to support any-to-any remultiplexing, DVB-ASI and AES scrambling, digital turnaround, linear ad splicing—and a wide variety of video processing applications. By adding the optional high-performance ACE® card, the ProStream 9100 also supports complex transcoding applications for the delivery of both broadcast and next-generation multiscreen services.

ProStream 9100 includes five rear panel slots for supporting DVB-ASI and IP (Gigabit Ethernet) I/O cards, as well as 8VSB input, in any combination. Two IP 100Base-T Ethernet interfaces are available for connection to conditional access systems (CAS), as well as to the management network. Through the CAS IP interface, the ProStream 9100 communicates with ECMGs and EMMGs for exchange of control words, ECMs and EMMs.

**High Performance, Highly Versatile**

With its ultrahigh-density architecture, the ProStream 9100 dramatically reduces the amount of rack space required to meet growing processing requirements. System flexibility and workflow versatility are achieved with modular audio/video processing modules and high-capacity IP processing cards. Low power consumption, high reliability and simplified serviceability result in a best-in-class, multiformat platform that offers superior video quality and reduces OPEX.

High-performance data throughput is a cornerstone function of the ProStream 9100. The platform’s enhanced GbE I/O modules deliver up to 2 Gb of IP throughput for the multiplexing, scrambling and descrambling of up to 500 transport streams and services. Ideal applications for the ProStream 9100 include:

- ASI and IP DVB-CSA and IPTV AES scrambling
- Bulk descrambling
- IP networking of broadcast video
- ASI and IP mirroring
- ASI, IP and 8VSB remultiplexing of any service from any input to any output
- MPEG-2 transport stream over RTP/UDP for IP output
- Digital program insertion for splicing and local ad insertion
- DToIP statmux control
- DVB-EIT/PSIP table regeneration
- Slate insertion for service disruption message
- Emergency Alert System (EAS) compliance
MARKET BENEFITS

Digital Turnaround
With standard IP, DVB-ASI and 8VSB input and output interfaces, the ProStream 9100 processor is easily incorporated into existing headend environments and supports any digital turnaround architecture. The platform’s robust, extensible and highly scalable design supports diverse MPEG remultiplexing functions, including PID remapping, prioritizing and filtering, insertion and generation of PSI/SI tables, and PID multicast. Device, port, socket and service redundancy are supported, as well as multiple IP sockets for MPTS and SPTS applications. The compact platform not only reduces rack space and power requirements, but also simplifies network infrastructure while delivering a high-availability solution.

Linear Ad Splicing
Linear ad splicing, or digital program insertion, on ProStream 9100 enables the frame-accurate insertion of local and regional ads directly into live-to-air MPEG-2 and MPEG-4 AVC SD/HD transport streams. With this capability, broadcasters and service providers can increase average revenue per user by offering their advertisers the ability to reach differentiated viewers with targeted ads.

Ad splicing is a licensed feature for ProStream 9100 systems outfitted with a quad GbE I/O card. The powerful capability enables broadcasters to implement advanced advertising capabilities without needing to purchase a stand-alone, box-level splicing solution, saving them money while simultaneously opening up new revenue streams. In addition, by eliminating the need to decode signals to insert ads, workflows are optimized and video quality is maintained at the highest possible level.

Conditional Access
The ProStream 9100 processor’s industry-leading SimulCrypt Synchronizer (SCS) core supports DVB SimulCrypt versions 1, 2 and 3, and allows for the simultaneous connection of up to 30 different CA systems. The platform also supports AES encryption technologies for scrambling and descrambling applications.

Fully integrated with all leading CAS vendors and compliant with widely implemented industry protocols, ProStream scrambling technology is known in the industry for its stability and high performance. The ProStream 9100 platform can scramble any format of video, audio and data elementary streams (e.g., MPEG-2, MPEG-4 AVC, AC-3, AAC, HE-AAC), as well as multiplex SD and HD MPEG-2 video. The solution easily integrates into existing architectures, and reduces cost and complexity by eliminating the need for multiple devices in distributed cable, satellite or telecom networks.

Statistical Multiplexing
Harmonic’s DiviTrackIP™ option integrates multiplexing and IP switching by connecting ProStream 9100 units with remote Harmonic Electra™ encoders across a LAN or WAN, allowing any ProStream in the network to efficiently manage the encoders’ statmux pools. Support is available for up to 120 services per statistically multiplexed pool, 16 pools per platform, and three pools within a single transport stream.

IP Distribution
As major cable and telco MSOs migrate to centralized content aggregation, the ProStream 9100 platform offers a reliable solution for MPEG distribution over IP. The system supports bulk scrambling and descrambling, and enables secured content distribution by acting as the scrambler at the central headend and the edge descrambler at remote headends.

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“Pay As You Grow” Scalability
As processing needs evolve, the ProStream 9100 platform makes it easy to incrementally add or upgrade I/O modules and firmware licenses, simplifying scalability and extending the system’s value.

Control and Management
Processing on the ProStream 9100 is easily configured and controlled with Harmonic’s NMX™ Digital Service Manager video management system, a service-oriented solution for mass configuring, monitoring and automated redundancy in centralized or distributed architectures. ProStream 9100 also features an intuitive and user-friendly web-based GUI.

World-Class Service and Support
Harmonic stands behind the ProStream 9100 stream processor—and all of its products—with comprehensive service and support programs, including system design, service deployment, technical support and network maintenance. World-class service plans and a global network of flexible and responsive support professionals help ensure your ability to deliver outstanding "anytime, anywhere, any-device" customer experiences.

www.harmonicinc.com
### DUAL GBE I/O CARD
- **Type**: IEEE 802.3z
- **IP Ports**: Two independent
- **Connectors**: Two 1-GbE SFP (multi mode, single mode, copper)
- **I/O Speed**: 1,000 Mbps line rate input per port
- **IP Encapsulation**: MPEG TS over UDP/IP/MAC/RTSP/HRTP
- **MPEG Format**: 188 B per TS
- **MPEG Transport Streams**: MPTS and SPTS
- **I/O Processing**: 250 sockets
- **Maximum Bitrate per Socket**: 100 Mbps
- **Addressing**: Multicast, unicast
- **Management**: IGMPv1, IGMPv2, IGMPv3, ARP, ICMP
- **Forward Error Correction**: SMPTE 2021-1 and SMPTE 2021-2

### QUAD GBE I/O CARD
- **Type**: IEEE 802.3z
- **IP Ports**: Four independent
- **Connectors**: Two 1-GbE SFP (multi mode, single mode, copper)  
                          Two 1-GbE RJ45  
                          Two 10-GbE SFP+
- **I/O Speed**: 1,000 Mbps line rate input per port
- **IP Encapsulation**: MPEG TS over UDP/IP/MAC
- **MPEG Format**: 188 B per TS
- **MPEG Transport Streams**: MPTS and SPTS
- **I/O Processing**: 500 sockets
- **Maximum Bitrate per Socket**: 160 Mbps
- **Addressing**: Multicast
- **Management**: IGMPv1, IGMPv2, IGMPv3, ARP, ICMP

### DVB-ASI I/O CARD
- **Type**: ASI input/output
- **Connectors**: Four BNC, 75 Ω
- **I/O Direction**: Configurable, input or output, per port
- **MPEG Format**: 188 B per TS
- **I/O Processing**: One MPTS/SPTS per port
- **ASI I/O Ports**: 1-7 (each card has four ports)

### 8VSB INPUT CARD
- **Type**: 8VSB for ATSC reception
- **Connectors**: Four F, 75 Ω
- **I/O Direction**: Input
- **MPEG Format**: 188 B per TS
- **I/O Processing**: One MPTS per port
- **8VSB Input Ports**: Four per card (up to four cards)
- **Tuner Channels**: 2-59
- **Packet Error Rate Threshold**: 0-12,892 packets per second
- **Signal Quality Threshold**: 0.0-27.0 dB

### MANAGEMENT INTERFACES
- **Ethernet**: 1000Base-TX
- **Connectors**: Two RJ45 (1 management, 1 CAS)

### SCRAMBLING
- **SCS**: Internal
- **Standards**:  
  - DVB common scrambling
  - Open CAS
  - DVB SimulCrypt v1, v2 and v3
  - AES-CBC, AES-NSA2 scrambling algorithms
  - AES descrambling
  - Fix Key scrambling and descrambling
  - Selective encryption for VOD
- **CAS Connections**: Simultaneous connections to 30 different CA systems
- **BISS Encryption**: Mode 1
- **Number of ECMs**: 900 ECMs per platform

The optional Quad GbE I/O module in ProStream 9100 delivers up to 2 Gb of IP throughput.
## REMULTIPLEXING

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routing</td>
<td>Any input to any output</td>
</tr>
<tr>
<td>PID</td>
<td>Remapping, filtering, multicasting</td>
</tr>
<tr>
<td>PID Multicasting</td>
<td>Any input PID can be multicasted to multiple TS outputs with different remapping and processing (different CW, if scrambled)</td>
</tr>
<tr>
<td>PSI/SI, PSIP</td>
<td>Extraction, injection, spooling, regeneration</td>
</tr>
<tr>
<td>Output Mirroring</td>
<td>Any to any (ASI/IP to ASI/IP)</td>
</tr>
<tr>
<td>Advanced Stream Processing</td>
<td>Intelligent service substitution, PID prioritization, PCR generation, PID range</td>
</tr>
</tbody>
</table>

## REDUNDANCY

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1</td>
<td>Under NMX or stand-alone GUI management</td>
</tr>
<tr>
<td>N:1</td>
<td></td>
</tr>
<tr>
<td>N:M</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Service</td>
<td>Any-to-any input TS</td>
</tr>
<tr>
<td>I/O port</td>
<td></td>
</tr>
<tr>
<td>IP port mirroring</td>
<td></td>
</tr>
<tr>
<td>TS output mirroring</td>
<td></td>
</tr>
</tbody>
</table>

| Triggers    | ETR290 |

## SYSTEM MANAGEMENT

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMX™ Digital Service Manager</td>
<td></td>
</tr>
<tr>
<td>Stand-Alone Web User Interface</td>
<td></td>
</tr>
</tbody>
</table>

## POWER

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td>Optional dual supplies</td>
</tr>
<tr>
<td>Input Voltage Range</td>
<td>85-264 VAC 42-60 VDC</td>
</tr>
<tr>
<td>Line Frequency</td>
<td>47-63 Hz</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Up to 200 W</td>
</tr>
</tbody>
</table>

## PHYSICAL

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (W x H x D)</td>
<td>19 in x 1.75 in x 27 in (1 RU) 48.26 cm x 4.45 cm x 68.69 cm</td>
</tr>
<tr>
<td>Weight</td>
<td>32 lbs/14.5 kg</td>
</tr>
</tbody>
</table>

## ENVIRONMENTAL

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling</td>
<td>Eight fans, temperature controlled air flow front to right side</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>+32°F to +122°F  0°C to +50°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-8°C to + 176°F  -20°C to +80°C</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>&lt;95% non-condensing</td>
</tr>
<tr>
<td>Electromagnetic Compliance</td>
<td>FCC Part 15 Class A  CE Mark (EN 55022 Class A and EN 50082-1:1997)</td>
</tr>
<tr>
<td>Safety</td>
<td>UL 1950 and cUL C22.2F950 EN 60950  Directive 2011/65/EU RoHS2</td>
</tr>
</tbody>
</table>