

# ProSwitch

IP & ASI REDUNDANCY SWITCH



**For applications requiring fast, dense and reliable 2:1 MPEG-2 transport stream redundancy switching, the ProSwitch from Harmonic is the best-in-class solution to ensure 24/7 availability of digital TV signals.**

When down time is not an option, you can depend on the ProSwitch. The compact, stand-alone system continuously monitors your MPEG-2 TS, seamlessly switching to a backup stream if the active stream is detected as being corrupted. Whether used for equipment redundancy or network-path redundancy, the ProSwitch offers the utmost in performance, flexibility and delay capability to increase robustness and maximize up time of your broadcast and transmission chains – and ensure that your MPEG-2 TS (DVB, DVB-T/T2 or ATSC) can be properly secured. In addition, ProSwitch can perform FEC correction of incoming TS over IP streams to cope with packet loss. On the output, FEC generation can be activated.

Offering up to 16 2:1 IP switches or four 2:1 ASI switches in 1 RU, the high-density ProSwitch provides cost, power and space savings, helping operators to save on CAPEX and OPEX.

## Reliable & Flexible

Available with Gigabit Ethernet or ASI interfaces, the ProSwitch is suitable for any type of architecture: from widely deployed ASI-based headends to new IP-centric networks. The switch is equipped with dual power supplies/plugs to maximize service availability, and maintains service delivery via a smart and configurable bypass mechanism on the GbE and ASI interfaces – even in case of power failure.

## Highly Configurable Testing

The ProSwitch measures the health of incoming streams via a wide range of configurable tests. It supports TR 101 290 tests (Priority 1/2/3) to provide a complete health-status check of your digital DVB network. The unit also supports testing and monitoring models that provide the same level of comprehensive information for ATSC environments. To improve redundancy, template checking of expected PIDs, rate limits and/or scrambling status of various critical program components are available. Each test can be configured and associated to a critical alarm level that either engages switching or logs the alarm. In addition, tests can be set to avoid unwanted switching in the case of transitory events (time persistence mechanism).

## Delay Compensation Capability

The ProSwitch offers delay-compensation capability by simultaneously analyzing delayed input streams (from several milliseconds to several seconds). If one input is detected as being corrupted, the unit compensates for the time difference and switches seamlessly to the other uncorrupted stream without any disturbance to end users. The typical application is network distribution redundancy.

## Designed For Terrestrial Networks

ProSwitch can perform seamless switching for DVB-T/T2 terrestrial networks, by preserving the SFN structure of the incoming transport streams. In DVB-T, ProSwitch can realign the megaframe structures, generated by the upstream SFN adapters. In a DVB-T2 environment, it also realigns the T2-MI streams generated by the upstream DVB-T2 gateways (such as the Harmonic ProStream™ X processor).

## HIGHLIGHTS

- Dense 2:1 switch in 1 RU
  - Up to 16 TS over IP switches (up to eight with DVB-T/T2)
  - Up to four TS over ASI switches
- Seamless switching
- DVB, DVB-T/T2 and ATSC support
- FEC correction and generation
- Input delay compensation
- Smart bypass on ASI and GbE
- TR 101 290 Priority 1/2/3 analyses
- MIP analyses for DVB-T/SFN
- T2-MI/DVB-T2 analyses
- Template checking for stream content matches
- Dual AC or DC PSUs

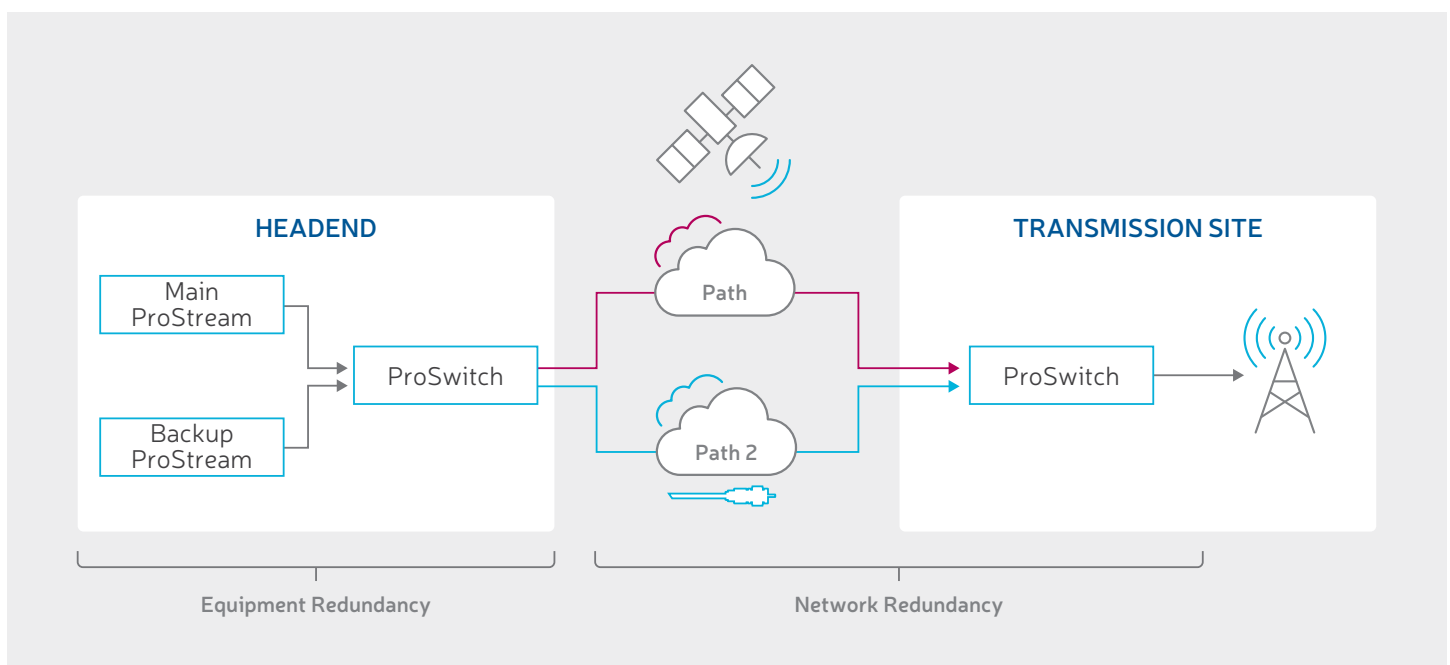
In case of switching, the ProSwitch preserves the structure and timestamp on its output, avoiding service outage on DVB-T/T2 modulators caused by resynchronization.

### Configuration & Supervision

The ProSwitch is equipped with a 100/1000Base-T port for control and supervision. The unit can be supervised and configured remotely through any standard web browser, and provides a complete display of switching configurations, along with easy-to-read input/output status information, error-log data and bitrate graphics. The ProSwitch embeds an SNMP agent for centralized management applications.

### World-Class Service and Support

Harmonic stands behind the ProSwitch redundancy switch 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.



ProSwitch Application Example

## SPECIFICATIONS

### TS OVER ASI SWITCH

- Up to four 2:1 TS over ASI switching functions
- Up to eight ASI inputs
- Up to eight ASI outputs: four smart secured outputs, four smart outputs
- Smart bypass on ASI outputs to preserve user-selected TS inputs or last switch position
- Byte or packet mode automatic detection
- Configurable ASI outputs for monitoring purpose

### TS OVER IP SWITCH

- Up to 16 TS over IP switching functions (up to eight in case of DVB-T/T2)
- Four GbE 100/1000Base-T ports (twisted pair, RJ45)
- Configurable bypass on GbE ports (link down mode pass-through mode)
- IPv4
- UDP/RTP or UDP encapsulation
- Multicast
- IGMPv2/v3
- VLAN
- TS over IP output duplication (up to four per switching function)
- FEC correction and FEC generation

## SPECIFICATIONS

### DELAY COMPENSATION

- Available on ASI and IP switches (up to several seconds)
- TS seamless switching for identical TS (network redundancy)
- DVB-T/SFN seamless switching (mega-frame)
- DVB-T2/SFN seamless switching (T2-MI) with ProStream X (T2-MI gateway)

### SWITCHING CONDITIONS

- Full real-time monitoring of all incoming transport streams
- TR 101 290 Priority 1/2/3 analysis
- Advanced tests: PID max/min bitrate, stuffing max/min bitrate, service presence, scrambling PIDs, DVB-T MIP checking, DVB-T2 T2-MI packet checking

### SWITCHING STRATEGIES

- Automatic switch supporting TS input priority (Main/Spare mode)
- Automatic switch on TS input upon failure (Redundancy mode)
- Manual switch

### CONTROL & SUPERVISION

- Web GUI for remote control
- SNMP v2 agent for NMS
- Ten GPI inputs
- Four contact closure outputs

### PHYSICAL

- Dimensions (H x W x D) 1.7 in x 17.2 in x 16 in (1 RU)  
4.3 cm x 44 cm x 38 cm
- Weight 11.1 lbs/5.6 kg
- Power Supplies Dual and Redundancy
- Input Voltage 100-240 VAC, or -48V DC (IP chassis only)
- Input Frequency 50-60 Hz
- Power Consumption Up to 55 W

### ENVIRONMENTAL

- Operating Temperature 41° to 104° F  
5° to 40° C
- Storage Temperature -13° to 158° F  
-25° to 70° C
- Operating Humidity < 95% non-condensing
- Electromagnetic Compliance EN55032  
EN55024  
EN61000-3-2  
FCC, ICES
- Safety IEC 60950  
EN60950  
CSA/UL60950  
IEC 62368  
EN62368  
CSA/UL 62368  
K60650  
AS/NZS 60950
- CE Low Voltage Directive 2014/35/EY  
EMC Directive 2014/30/EU  
ROHS Directive 2011/65/UE  
WEEE 2012/19/EU  
REACH 2006/1907/EC

## ORDERING INFORMATION

### BASE SYSTEM

Part Number	Description
PSW-1U-2AC-ASI-LITE	1-RU chassis with redundant AC power supply, eight ASI input + eight ASI output (including four bypass output), 10 GPI input and four free voltage contacts. Light front panel (without display and controls).
PSW-1U-2AC-IP-LITE	1-RU chassis with redundant AC power supply, four GbE ports (including port bypass), 10 GPI input and four free voltage contacts. Light front panel (without display and controls).
PSW-1U-2DC-IP-LITE	1-RU chassis with redundant DC power supply, four GbE ports (including port bypass), 10 GPI input and four free voltage contacts. Light frontpanel (without display and controls).
PSW-SW-BASE	Software release. Enables product configuration, control and supervision (Web GUI and SNMP)

### SOFTWARE OPTIONS

One license required per chassis.

Part Number	Description
PSW-LIC-DVB	Enables DVB streams analysis and seamless switching
PSW-LIC-DTT	Enable terrestrial streams analysis and seamless switching (DVB-T with MIP packets and DVB-T2/T2-MI)
PSW-LIC-ATSC	Enables ATSC streams analysis and seamless switching
PSW-LIC-FEC	Required for TS over IP switches with SMPTE2022 FEC correction on inputs or SMPTE2022 FEC generation on outputs

### SWITCHING LICENSES

One license required per switching function (e.g., three licenses required for triple ASI or TS over IP switch).

Part Number	Description
PSW-LIC-ADV-SWITCH	1:1 switching license, advanced TS input monitoring including TR101290 Priority 1/2/3 and advanced tests