

# 7700R2x2-HD, 7700R2x2-HES, 7700RD2x2-HD

## 2x2 HD/SD Modular Bypass Protection Routers



The 7700R2x2 series modules are bypass protection routers for high definition 1.5 GB/s or standard definition 270Mb/s serial digital video signals. These modules have two SD/HD compatible inputs signals (program and back up) that support all popular ST 292-1 video formats as well as 525/625 line SMPTE ST 259-1 video formats. These modules also provide three re-clocked primary outputs, and one re-clocked backup output. Based on a programmable set of input signal monitors, the main program or the back-up input signals can be automatically routed to the primary program outputs to ensure the delivery of a valid program output in the case of an input signal fault. Switching can also be controlled and monitored using module GPIOs, card edge controls or remotely using either network control panels (CP-2116E, CP-2232E) or VistaLINK® PRO. The program output is bypass relay protected and provides protection on the program path. If the module is removed from the enclosure or power to the module is lost, the program path is maintained.

The 7700R2X2-HES incorporates Evertz® proprietary SoftSwitch™ technology with full audio proc for clean video and “popless” embedded audio switching. Line synchronizers on the video inputs can accommodate differences in timing of up to ±1/2 a line on the video inputs. The 7700RD2X2-HD provides two monitoring down-converted outputs.

### ► Features & Benefits

- Support for HD and SD SDI inputs per ST 292-1 and SMPTE ST 259-1
- Auto sensing of HD and SD input formats
- Supports both 525i/59.94 or 625i/50 SD video formats
- Automatic change-over based on programmable input signal monitors
- Generation of three re-clocked program outputs and one preview output (HD if HD inputs are applied, SD if SD inputs are applied)
- GPI control inputs for manual routing control
- GPO status outputs for reporting selector cross-point status
- Card edge menu control for configuration of operating modes
- Card edge LEDs for reporting signal presence, router state, module status
- Remote monitoring through NCP panels or VistaLINK® PRO
- Bypass relay protection on program output
- Controllable switch point when a Genlock reference is provided
- VistaLINK® capable for remote monitoring, control and configuration capabilities via SNMP; using VistaLINK® PRO, CP-2116E or CP-2232E Control Panels. VistaLINK® is available when modules are used with the 3RU 7800FR frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### Additional features on 7700RD2X2-HD model only

- Program and preview monitoring SDI outputs (down-converted from HD if HD input applied, relocked SD if SD input applied)
- Support for 16:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze aspect ratio conversions
- HD to SD color space conversion (ITU rec. 709 to ITU rec. 601)

The 7700R2x2-HD provides additional MPEG-2 feed redundancy switching. By providing automatic smart switching of the main signal to a back up signal, the 7700R2x2-HD offers protection to digital compressed signals. The user can customize all monitored and switching rules to meet Broadcast, Cable, Satellite and IPTV needs.

The 7700R2X2-HD and 7700R2X2-HES occupy one card slot and can be housed in the 1RU 7801FR frame that holds up to four single or two dual slot modules, the 3RU 7800FR frame that has a 15-slot capacity, the portable 3RU 350FR frame that has a 7-slot capacity, or a standalone enclosure that holds a single module.

### The 7700R2x2-HD Supports:

HD/SD-SDI and ASI TS Monitoring with Smart Switch Protection

### The 7700R2x2-HES Supports:

HD/SD-SDI Monitoring with Smart Switch Protection and Embedded Clean Switch

### Additional features on 7700R2X2-HES model only

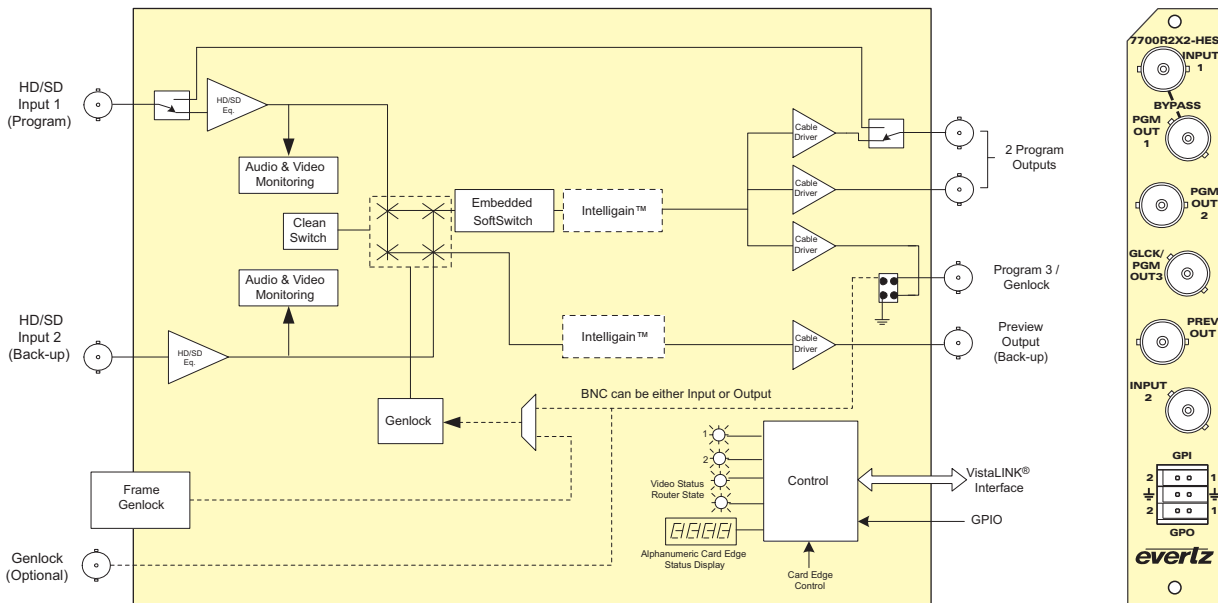
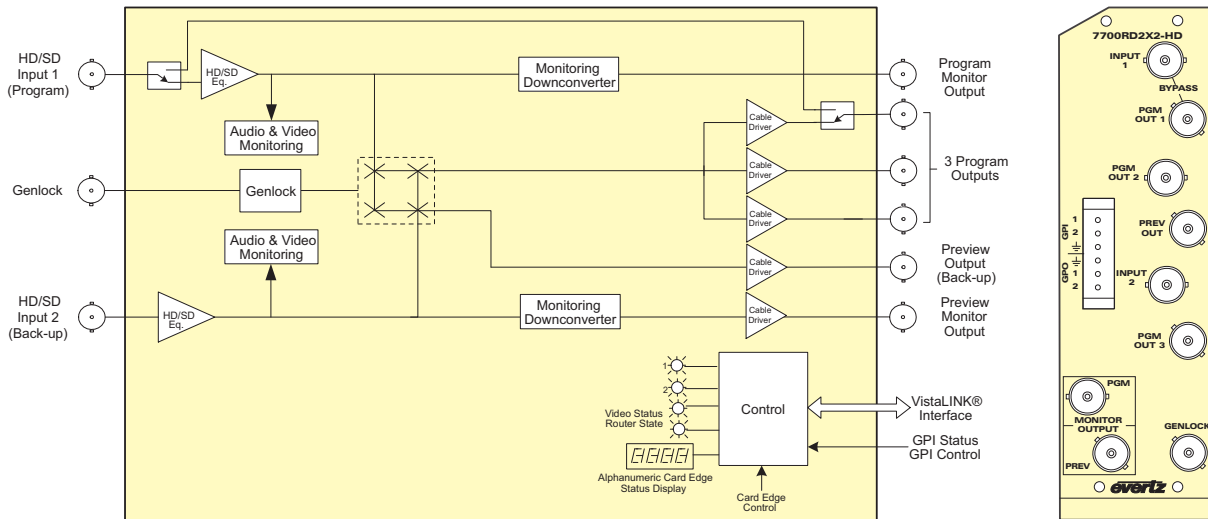
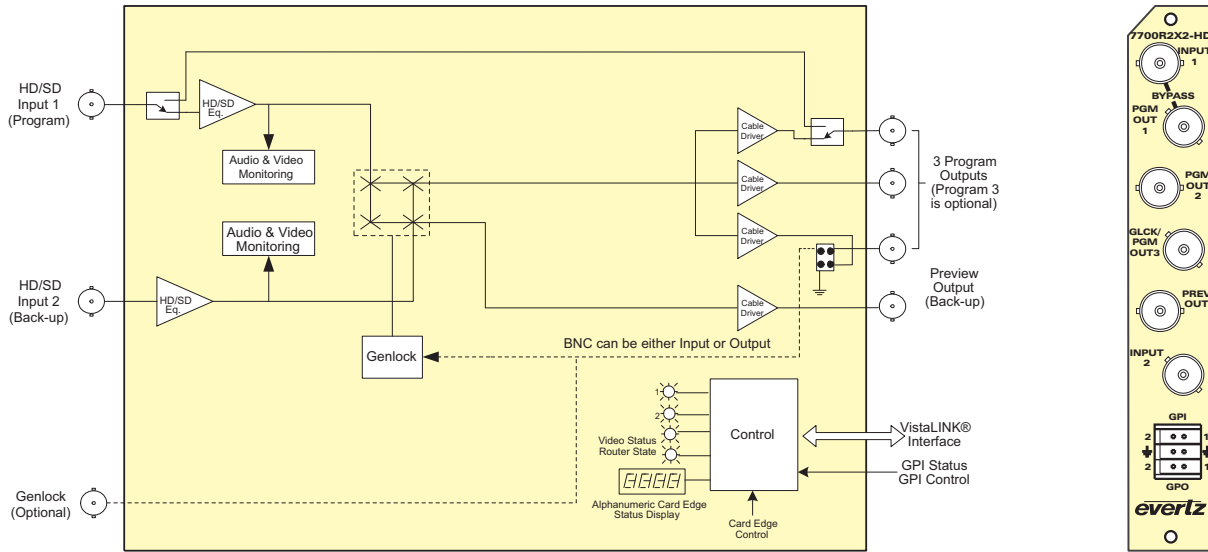
- Integrated SoftSwitch technology for clean video and “popless” embedded audio switching
- Dolby E® compliant
- VistaLINK® capable for remote monitoring, control and configuration capabilities via SNMP. VistaLINK® is available when modules are used with the 3RU 7800FR frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

### Additional Features on the 7700R2x2-HD only

- TR101290 monitoring bitrate measurement and component matching test on all inputs
- Smart configuration of error threshold and switching rules to avoid false switching
- Complete TS data rate measurement with user settable measurement windows
- Essential TS monitoring including:
  - TS Loss
  - Sync Byte Error
  - Bitrate Analysis
  - PIDs List Monitoring
  - Continuity Count
  - PAT Monitoring

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### Specifications

#### Serial Video Input:

Standard: Auto-detects standard 1.485Gb/s ST 292-1 (1080i/59.94, 1080i/50, 720p/59.94, 720p/50) SMPTE ST 260-1, SMPTE ST 274, SMPTE ST 296, SMPTE ST 349-1 (HD or SD carrier) 270Mb/s SMPTE ST 259-1 (525i/59.94 or 625i/50), DVB-ASI (7700R2x2-HD only)

Connector: 2 BNC per IEC 61169-8 Annex A

Input Equalization: Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable

Return Loss: > 20dB up to 270MHz  
> 12dB up to 1.5GHz

#### Reclocked Serial Video Router Outputs:

Standard: Same as input

Number of Outputs: 3 Program outputs reclocked, (1 output is bypass relay protected) 1 preview output

Connector: BNC per IEC 61169-8 Annex A

Signal Level: 800mV nominal

DC Offset: 0V ±0.5V

Rise and Fall Time:  
HD: 200ps nominal  
SD: 900ps nominal

Overshoot: < 10% of amplitude

Return Loss: > 20dB up to 270MHz  
> 15dB at 1.5Gb/s

Jitter: < 0.16 UI (HD) or < 0.10 UI (SD)

#### Downconverted Serial Video Outputs

(7700RD2x2-HD only):

Standard: SMPTE ST 259M-1, 270Mb/s

Number of Outputs: 1 Program 1 preview

Connector: BNC per IEC 61169-8 Annex A

Signal Level: 800mV nominal

DC Offset: 0V ±0.5V

Rise and Fall Time: 750ps nominal

Overshoot: < 10% of amplitude

Return Loss: > 15dB at 270Mb/s

Jitter: < 0.2 UI

#### Genlock Input:

Type: NTSC or PAL Color Black 1V p-p HD Tri-level Sync

Connector: BNC per IEC 61169-8 Annex A

Termination: High impedance or internal 75Ω (jumper selectable)

#### GPIO Control Port:

Number of Inputs: 2

Number of Outputs: 2

Type: Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)

Connector: 6-pin removable terminal block

Signal Level: Closure to ground

#### Input to Output Processing Delay (HD input video on 7700RD2x2-HD only):

Downconverter Video Delay: Approximately 1 to 2 frames depending on input video format, processing mode

#### Electrical:

Voltage: +12V DC

Power:  
7700R2x2-HD: 10W  
7700R2x2-HES: 10W  
7700RD2x2-HD: 14W

EMI/RFI: Complies with FCC regulations for class A devices  
Complies with EU EMC directive

#### Physical (number of slots):

350FR, 7700FR-C, 7800FR:  
7700R2x2-HD: 1  
7700R2x2-HES: 1  
7700RD2x2-HD: 2

### Ordering Information

<b>7700R2x2-HD</b>	2x2 HD/SD Modular Bypass Protection Router
<b>7700R2x2-HES</b>	2x2 HD/SD Modular Bypass Protection Router with SoftSwitch™
<b>7700RD2x2-HD</b>	2x2 HD/SD Modular Bypass Protection Router with dual HD Downconverter

<b>CP-2232E</b>	Remote Control Panel
<b>Rear Plate Suffix</b>	
<b>+3RU</b>	3RU Rear Plate for use with 350FR, 7700FR-C or 7800FR Multiframe
<b>+SA</b>	Standalone Enclosure Rear Plate

**Ordering Options** Rear Plate must be specified at time of order (Eg. Model +3RU)

**+IG** Integrated IntelliGain™ Audio and Loudness Processor (on 7700R2x2-HES only)

**+BPRP** Bypass relay protection for preview output (In addition to program output, 7700R2X2-HD and 7700R2X2-HES only)

**Accessories**  
**7700FC** VistaLINK® Frame Controller  
**CP-2116E-H** Remote Control Panel

#### Enclosures

<b>350FR</b>	3RU Portable Multiframe which holds up to 7 single slot modules
<b>7700FR-C</b>	3RU Multiframe which holds up to 15 single slot modules
<b>7800FR</b>	3RU Multiframe which holds up to 15 single slot modules
<b>7801FR</b>	1RU Multiframe which holds up to 4 single or 2 dual slot modules
<b>S7701FR</b>	Standalone Enclosure

The Complete Solution Provider

