7660
HD/SD Embedder, Disembedder and Data Inserter

The 7660 module is an eight-channel audio embedder or disembedder for 1.5 high definition or 270 Mb/s standard definition signals. Four AES ports automatically configure as inputs or outputs depending on if the module is configured as mux or demux. Additionally, four channels of analog audio are supported.

Configurable Mux or Demux

When configured as a multiplexer, the 7660 has one serial digital video input and four AES audio inputs. These four AES streams are embedded into the video stream. AES inputs are sample rate-converted, allowing the use of asynchronous audio. The output of the module is a digital stream that contains the original video signal and four AES pairs, or eight channels.

When configured as a demultiplexer, audio signals present in the incoming video signal are extracted and delivered as standard AES digital audio streams.

The 7660 includes a full-featured, sixteen-channel audio mixer. The channel swap and shuffle capability allows you to completely rearrange and remix audio channels. It provides precise control over audio level, with up to 12 dB of gain to compensate for low level sources. Delay is adjustable up to one second.

In-Line Shuffler

Because the 7660 has simultaneous disembedding and embedding, it is an in-line processor for embedded audio. It can take embedded content, adjust levels and remap channels, and deliver it to the output as an embedded signal.

Dolby and AC-3

The 7660 can be fitted with Dolby and AC-3 encoding and decoding options. The 7615 decoding option can be fed from either an AES input or an AES stream disembedded from the incoming SDI signal. The resulting discrete surround signals are then selectable as inputs to the sixteen channel mixer/shuffler.

The 7630 Dolby encoder is fed from selected outputs of the sixteen channel mixer/shuffler. The resulting encoded bitstream can be output both on an AES output and embedded into the SDI output.

Additionally, the 7660 fully supports embedding and disembedding of encoded multi-channel bitstreams such as AC-3 and Dolby E.

LevelTrack™ Audio Loudness Control AGC Software and Compliance Options

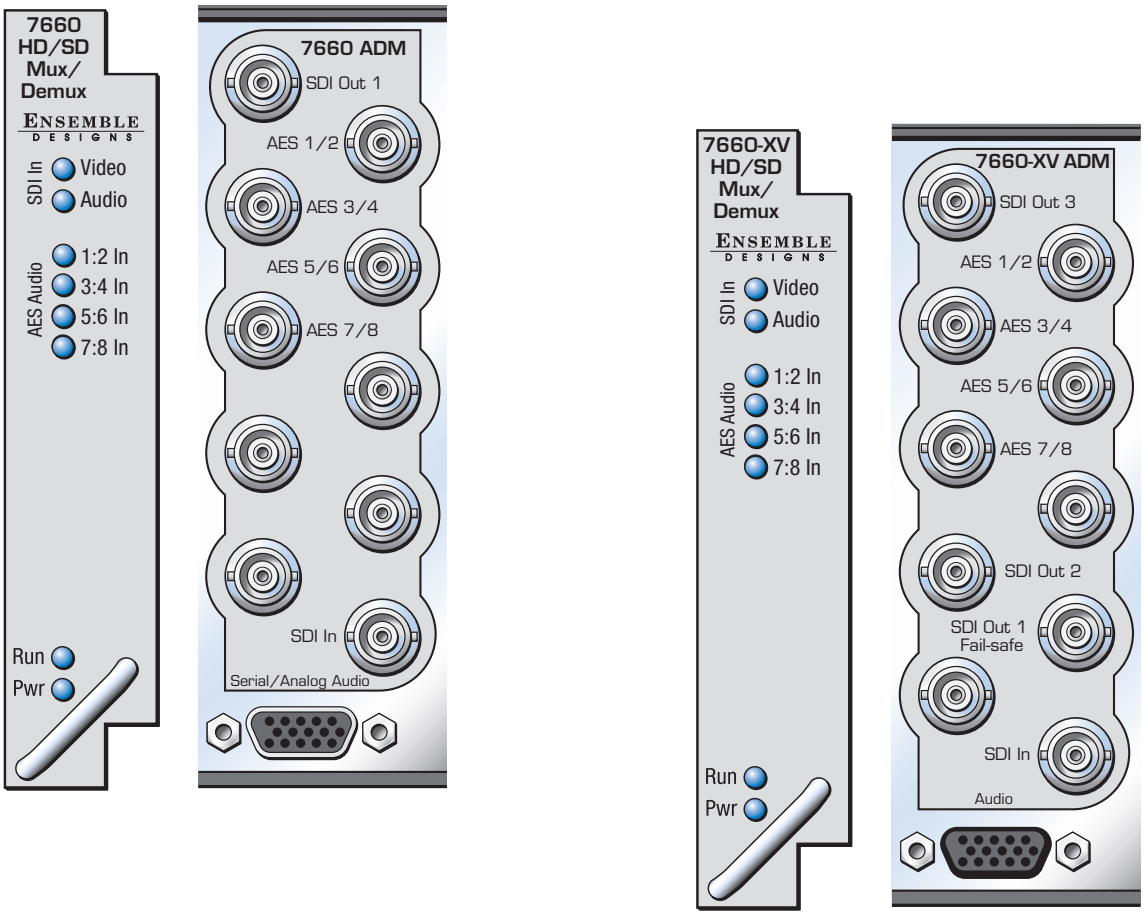
The 9670 LevelTrack Audio Loudness Control AGC software key can be added as an option. LevelTrack provides control for keeping audio levels consistent in program material.

The 9690 Audio Compliance and Monitoring Software can be added for compliance verification and archiving.

The 7660 can be configured locally or controlled and configured remotely with Avenue Touch Screens, Express Panels, or Avenue PC Software. Alarm generation, configurable user levels, module lockout, and customizable menus are just some of the tools included in the Avenue Control System.

Features

- **Audio embedder or disembedder for HD or SD signals**
- **Handles 4 AES streams/8 channels**
- **Analog audio I/O**
- **Dolby encoding and decoding options**
- **Up to one second of delay**
- **In-line processor for embedded audio**
- **Audio Automatic Loudness Control AGC software option**
- **Built-in audio mixer**
- **Phase inversion selectable on a channel basis**
- **Built-in sample rate converters accept asynchronous inputs**
- **26 bit processing resolution**
- **Data mux and demux as per SMPTE 337M**
- **Memory registers**



Order Info

7660	HD/SD Embedder, Disembedder and Data Inserter module
7660-XV	HD/SD Embedder, Disembedder and Data Inserter module XV configuration provides 3 SDI outputs
7615	Dolby E, Dolby D, AC-3 Decoder sub module and software key option Dolby processing options incur 1 frame of delay
7630	Dolby E Encoder sub module and software key option Dolby processing options incur 1 frame of delay
7635	Dolby D/AC-3 Encoder sub module and software key option Dolby processing options incur 1 frame of delay
9670	LevelTrack Audio Automatic Gain Control software key option
9690	Audio Compliance and Monitoring Software

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Input

Number	One
Signal Type	HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M or SD Serial Digital 270 Mb/s SMPTE 259M
Impedance	75 Ω
Return Loss	>15 dB DC to 1.5 GHz
Max Cable Length	270 Mb/s 300 meters Belden 1694A 1.485 Gb/s 100 meters Belden 1694A

Automatic Cable Input Equalization

Standards Supported

1080i 50, 59.94 or 60 Hz, SMPTE 274M -4,5,6
720p 50, 59.94 or 60 Hz, SMPTE 296M -1,2,3
1080p 23.98, 24 or 25 Hz, SMPTE 274M -9,10,11
1080sF 23.98, 24 or 25 Hz, RP211 -14,15,16
525i 59.94, 625i 50
Data, SMPTE 337M

Output

Number	One
Signal Type	HD or SD Serial Digital, follows input
Impedance	75 Ω
Return Loss	>15 dB DC to 1.5 GHz

AES/EBU Digital Inputs

Number	Four (total of eight channels) selectable as inputs or outputs
Type	AES3id or data (SMPTE 337)
Connector	Coaxial, 75 Ω
Bit Depth	20 and 24 bit
Sample Rate	30 kHz to 100 kHz (sample rate converted internally to 48 kHz)
Crosstalk	<144 dB
Dynamic Range	>144 dB
Reference Level	-18 or -20 dBFS (selectable)

AES/EBU Digital Outputs

Number	Four (total of eight channels) selectable as inputs or outputs
Type	AES3id or data
Connector	Coaxial, 75 Ω
Bit Depth	20 and 24 bit
Sample Rate	48 kHz, synchronous to video output
Reference Level	-18 or -20 dBFS (selectable)

Analog Audio Inputs

Number	Four, selectable as inputs or outputs
Type	Balanced
Connector	15 pin D
Impedance	>15K Ω
Maximum Input Level	24 dBu
CMRR	>60 dB, 20 Hz to 10 KHz
Quantization	24 bits, 128 x oversampled
Sample Rate	48 KHz
Reference Level	-10 dBu or +4 dBu
Frequency Response	±0.1 dB, 20 Hz to 20 KHz
Crosstalk	<106 dB
Dynamic Range	>106 dB

Analog Audio Outputs

Number	Four, selectable as inputs or outputs
Type	Balanced, transformerless
Connector	15 pin D
Impedance	30 Ω
Maximum Output Level	24 dBu
Resolution	24 bits, 128 x oversampled
Reference Level	-10 dBu or +4 dBu
Frequency Response	± 0.1 dB, 20 Hz to 20 KHz
Crosstalk	<106 dB
Dynamic Range	>106 dB

Dolby Metadata Inputs/Outputs

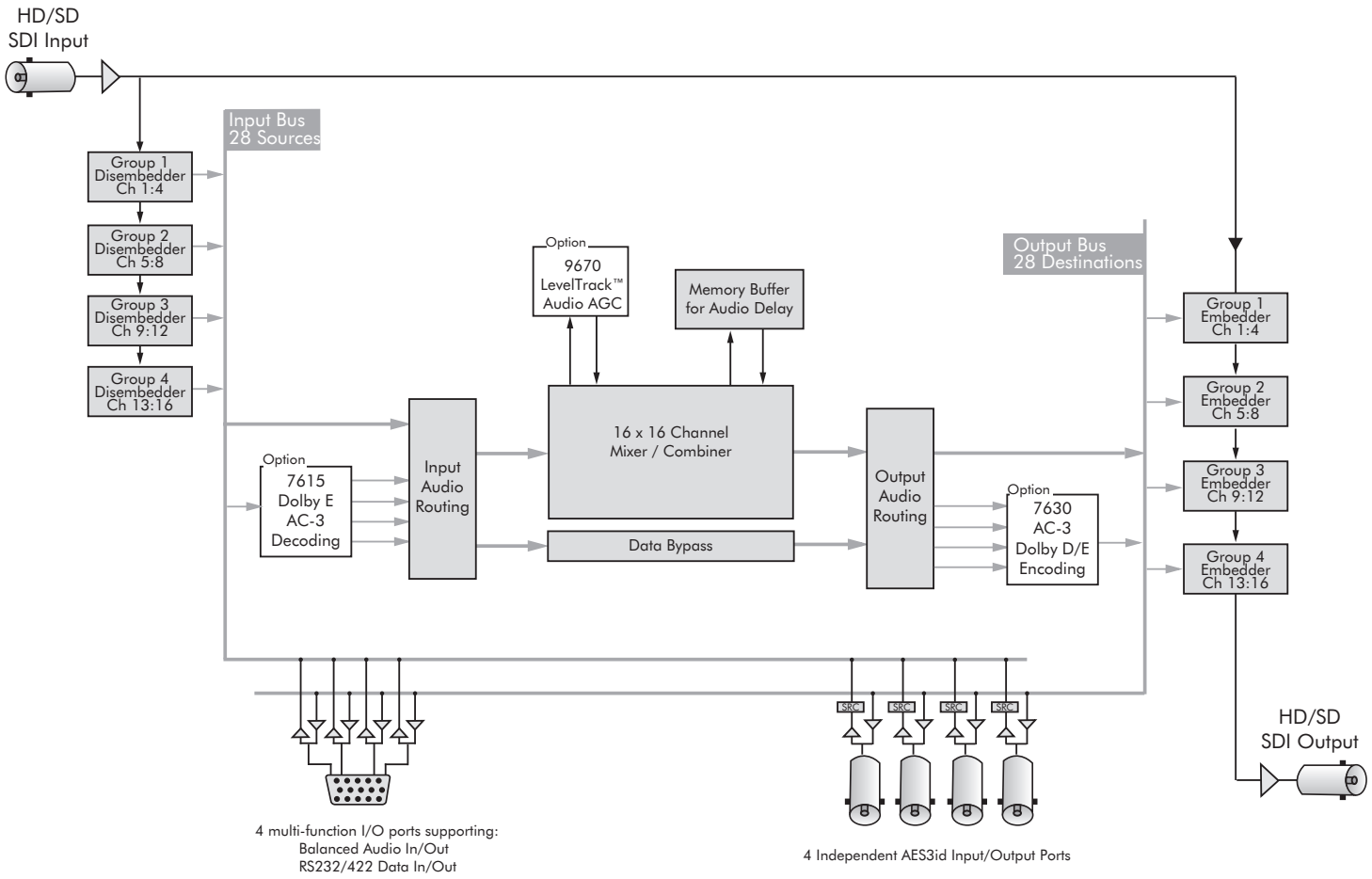
Signal Type	Dolby metadata, RS-422, RS-485
Number	Four, selectable as inputs or outputs, share with analog audio I/O
Connector	HD-15, balanced

Embedded Output (In SDI Outputs)

Group Assign	Cascade or replace
Channels	Sixteen
Bit Depth	24 Bit

General Specifications

Power Consumption	10 watts
Temperature Range	0 to 40°C ambient (all specs met)
Relative Humidity	0 to 95%, noncondensing
Altitude	0 to 10,000 ft



Above, block diagram for the 7660 HD/SD Embedder, Disembedder and Data Inserter module

Alternately, for 3 SDI outputs, order the 7660-XV HD/SD Embedder, Disembedder and Data Inserter module