

Aviia™

Advanced Video Interface for Industrial Applications

The Aviia™ Visually Lossless CODEC (HD-VLC™) and reference design provides a complete solution for the transmission of High Definition (HD) video over long runs of coaxial cable. Using a single 75-ohm coax cable, such as Belden RG59, the reference design can send serial digital HD video signals over cable lengths up to 300m.



The Aviia™ HD-VLC™ solution supports the following common HD video and HDcctv 1.0 formats:

- 720p25, 29.97, 30, 50, 59.94, 60
- 1080p25, 29.97, 30
- 1080i50, 59.94

Aviia HD-VLC CODEC & REFERENCE DESIGN

SOLUTION FOR HD VIDEO

Aviia™ HD-VLC™

The Aviia HD-VLC is based on a simple visually lossless implementation of the Dirac compression tool kit (<http://diracvideo.org/>). The visually lossless encoder is used to reduce the video bandwidth, using a very low latency mode, from a transmission rate of 1.485 Gb/s to 270 Mb/s.

At a data rate of 270 Mb/s, the serial digital encoded HD video can be transmitted over longer runs of coaxial cable using Gennum's Aviia transmitter and receiver components. The table below shows a comparison of cable reach performance between HD video transmission at 1.485 Gb/s and HD-VLC encoded HD at 270 Mb/s for various common coaxial cable types.

Coaxial Cable Reach Comparison

Cable Type	Aviia™ HD-VLC™ HDcctv 2.1 (Proposed) 270 Mb/s	Aviia™ HDcctv 1.0 1.485 Gb/s
RG11 14AWG	670	330
Belden 1694A 18AWG	460	230
RG6 18AWG	370	180
RG59 20AWG	300	150
Belden 1855A 23AWG	230	110
Canare 3C2V 25AWG	190	90

After transmission over the coaxial cable, the 270 Mb/s serial data is recovered using the GV7601 Aviia HD receiver and the data decoded back to the native HD format in the FPGA. The encoding and decoding process has a total latency of between 12 and 14 HD lines, which makes the CODEC ideal for low latency real-time applications.

The hardware reference design is based on the GV7600 Aviia HD transmitter and GV7601 Aviia HD receiver. The CODEC is implemented in FPGA code targeted at a low cost Xilinx Spartan 6 FPGA. The hardware can be configured as an encoder or decoder via a simple switch.

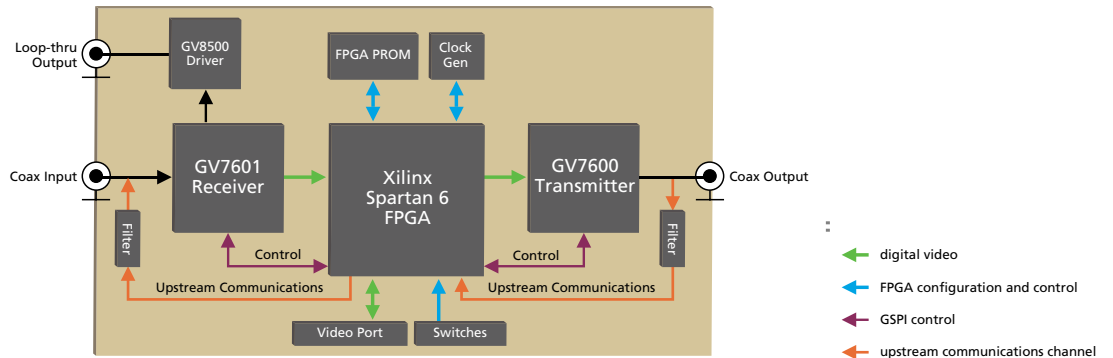
The HD-VLC reference design also includes an Upstream Communications Channel (UCC) for up-the-cable control functions, such as Pan/Tilt/Zoom (PTZ), status monitoring, remote control and configuration. The dedicated UCC is designed to operate up to 10Mb/s with 4b/5b link encoding. The UCC is also optimized for the proposed physical layer and upstream protocol for HDcctv 2.0 applications.

For HD source applications, such as HD cameras, the FPGA-based HD-VLC encoder plus GV7600 transmitter portion of the reference design can be implemented. For HD sink applications, such as Digital Video Recorders (DVR) or HD displays, the FPGA-based HD-VLC decoder plus GV7601 receiver portion of the reference design can be implemented.

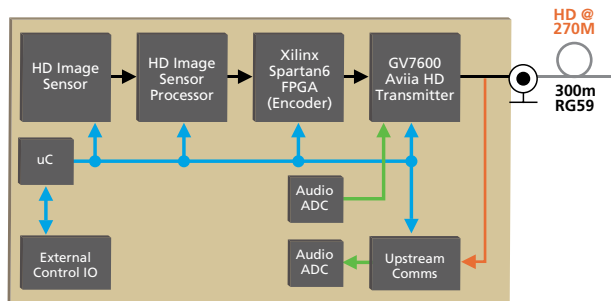


The complete Avia™ HD-VLC™ reference design can be used to implement converter boxes, enabling extended cable reach transmission for existing 1.485 Gb/s based HD products and solutions. The CODEC is also proposed for next generation HDcctv products (under consideration for HDcctv 2.1). Avia HD-VLC based cable extender products are available from NuMedia Technologies UK Limited (<http://www.numediotechnology.com/>).

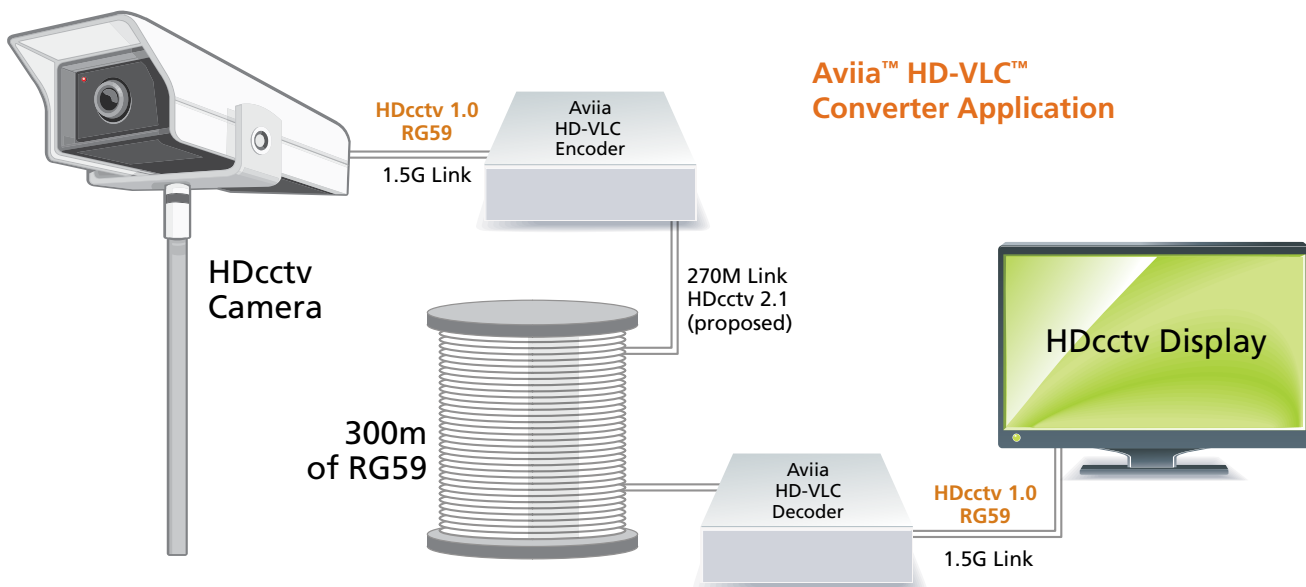
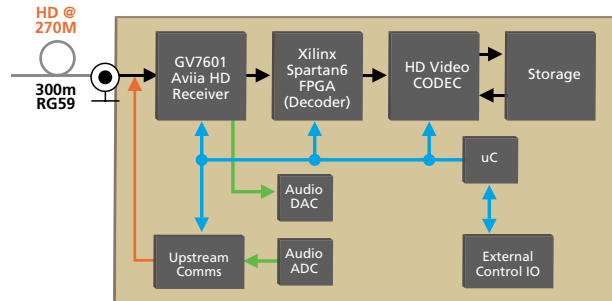
Avia™ HD-VLC™ Reference Design



Avia™ HD-VLC™ Camera Application



Avia™ HD-VLC™ DVR Application

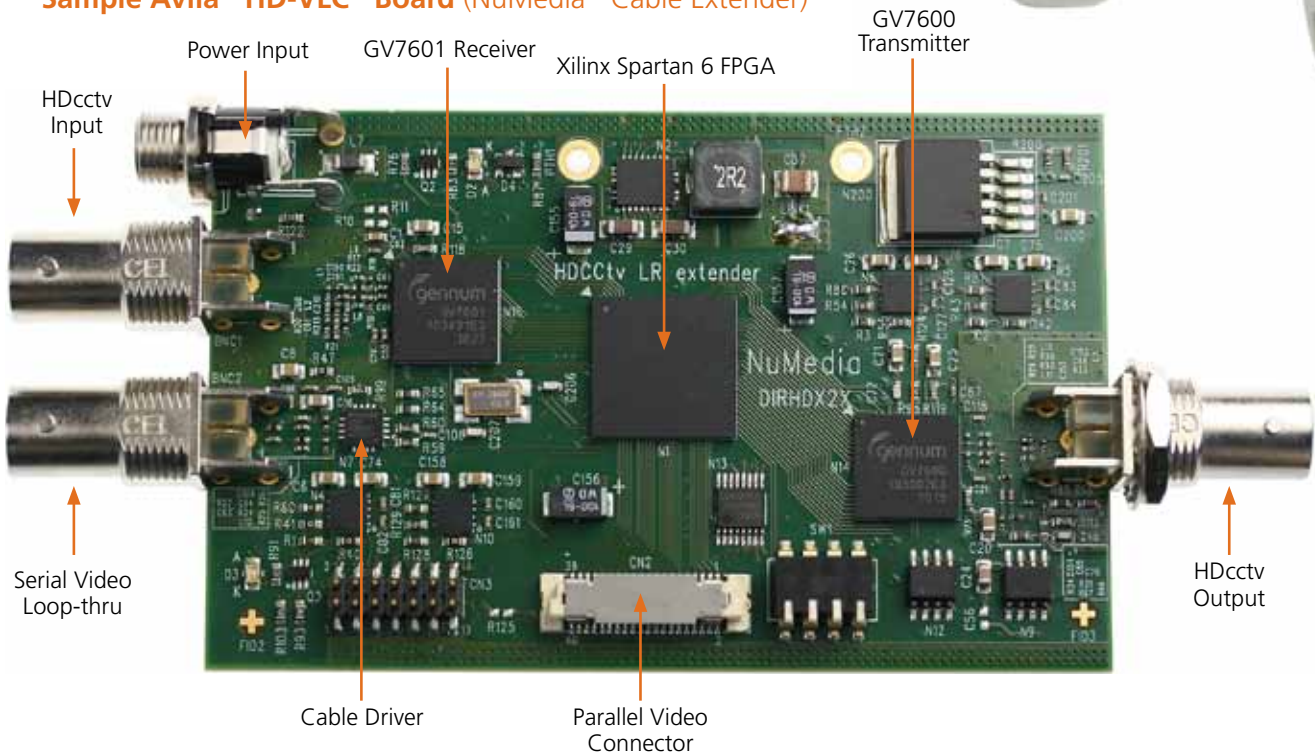


Applications

- HD video surveillance cameras
- Digital video recorders (DVR)
- HD camcorders
- HD monitors & displays
- Industrial imaging
- Video servers
- Cable extenders
- Digital signage



Sample Avia™ HD-VLC™ Board (NuMedia™ Cable Extender)



The HDcctv Alliance

Gennum is a founder and charter member of the HDcctv Alliance, the global trade association that develops and promotes the global industry specification for High Definition closed-circuit television (HDcctv). The HDcctv specification is derived from broadcast industry standards for serialized transmission of uncompressed video over coaxial cable. HDcctv is being developed to provide for transmission of digital video over various media, including optical fiber and twisted-pair (Cat-X), and optimizes the camera to DVR/display connectivity for video surveillance requirements.

The Alliance promotes industry adoption of HDcctv technology, and it provides education to the security industry and end market. The Alliance compliance program facilitates the development of high-quality, readily interoperable HDcctv devices. Products that have earned a certificate to display the HDcctv logo are advertised as having done so by the Alliance.



Further information is available by visiting the HDcctv Alliance website at www.highdefcctv.org



LEARN MORE:

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