ITU656

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ITU-R Recommendation BT.656, sometimes also called **ITU656**, describes a simple digital video protocol for streaming uncompressed PAL or NTSC Standard Definition TV (525 or 625 lines) signals. The protocol builds upon the 4:2:2 digital video encoding parameters defined in ITU-R Recommendation BT.601, which provides interlaced video data, streaming each field separately, and uses the YCbCr color space and a 13.5 MHz sampling frequency for pixels.

The standard can be implemented to transmit either 8-bit values (the standard in consumer electronics) or 10-bit values (sometimes used in studio environments). Both a parallel and a serial transmission format are defined. For the parallel format, a 25-pin Sub-D connector pinout and ECL logic levels are defined. The serial format can be transmitted over 75-ohm coaxial cable with BNC connectors, but there is also a fibre-optical version defined.

The parallel version of the ITU-R BT.656 protocol is also used in many TV sets between chips using CMOS logic levels. Typical applications include the interface between a PAL/NTSC decoder chip and a DAC integrated circuit for driving a CRT in a TV set.

Data format

A BT.656 data stream is a sequence of 8-bit or 10-bit bytes, transmitted at a rate of 27 Mbyte/s. Horizontal scan lines of video pixel data are delimited in the stream by 4-byte long SAV (Start of Active Video) and EAV (End of Active Video) code sequences. SAV codes also contain status bits indicating line position in a video field or frame. Line position in a full frame can be determined by tracking SAV status bits, allowing receivers to 'synchronize' with an incoming stream.

Individual pixels in a line are coded in YCbCr format. After an SAV code (4 bytes) is sent, the first 8 bits of Cb (chroma U) data are sent then 8 bits of Y (luma), followed by 8 bits of Cr (chroma V) for the next pixel and then 8 bits of Y. To reconstruct full resolution Y,Cb, Cr pixel values, chroma upsampling must be used.

References

- ITU-R Recommendation BT.656: Interfaces for digital component video signals in 525-line and 625-line television systems operating at the 4:2:2 level of Recommendation ITU-R BT.601 (Part A).

See also

- CCIR 601

Categories: Digital television | Film and video technology | Serial digital interface | ITU-R recommendations