



SingMai Electronics

Company Overview

July 2017



Daniel Ogilvie is the Technical Director of SingMai. Daniel has worked for both large and small companies in such diverse fields as university physics research support, high-end broadcast video, DVD recorder front end semiconductors, video decoder IC design and high volume consumer electronics, in countries as varied as Canada, USA, UK, Thailand and Singapore.

Products that Daniel has been involved in include forensic glass refractive index measurement equipment (occasionally featured on the US TV program, CSI); very low-light photon counting video processors; broadcast quality video decoders and encoders, very high resolution real-time video processors, IC design of video input processors and very low noise amplifiers.

Daniel is a senior member of the IEEE, has a Masters degree in Art History and is the author of three novels.

'Dan has a world-class understanding of the analogue video standards ...'
 Mark Kwong, Director of Engineering, LSI

Design and manufacture of products for the video, imaging and broadcast markets

Established in September 2009.

Registered office and R&D in Ayr, Scotland.

Sub-contract manufacturing by Glendale, Singapore.



Customers include:

Lockheed/NASA (USA),

L3 (Canada/USA),

Fuzhou Rockchip (China),

Rhode and Schwarz (Germany),

Teamcast (France),

Techsource Inc. (USA),

Scientronic (Taiwan),

Newport Media (USA),

ATX Networks (Israel/Canada/USA),

HikVision (China),

Vision on Chip (South Korea),

Aerovironment (USA),

Innosilicon (China),

Techpoint (USA),

Eyenix (S. Korea),

Aegis Electronic Group Inc. (USA) . . .

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Transmitting HD video over RG-59 cable

Daniel Ogitvle, Technical Director of SingMai Electronics -December 06, 2012

1 Comments



Introduction

There is an increasing need to be able to transmit high definition (HD) video over long cable runs, e.g., for security camera installations. In many cases the cable installation is pre-existing and uses low cost RG-59 cable but this cable is limited to low frequency use (<200MHz) for most applications; at 1GHz its attenuation is 30dB/100m).

Existing methods to transmit HD video include separate analogue RGB/YPbPr; which requires three coaxial cables to transmit, or HD-SDI (and its derivative HD-CCTV), a serial digital transmission method which runs at a bit rate of 1.485MHz and can only achieve small distances with such cable.

Whilst analogue cable equalizers are available from some semiconductor manufacturers (e.g., Analog Devices and Intersil), they still require the transmission of three components (e.g., YPbPr) which involves the re-installation of additional cables, which can add considerably to the total system cost of a security installation.

Other methods, such as compression of the video prior to transmission, (the IP camera), add considerable cost and power budget to each camera as well as limiting options in the post-processing of the image.

In this article we will discuss a method of transmitting HD video across this medium using a modified form of the well-known NTSC analogue composite video standard to create the signal for transmission: we have christened the method HD-CVI, for High Definition Composite Video Interface.

Distances of greater than 300m are achievable and in excess of 500m at 720p/60Hz with some small signal degradation. As with most analogue transmission methods, the signal degradation is

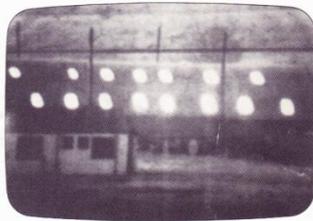
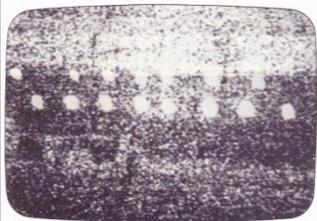
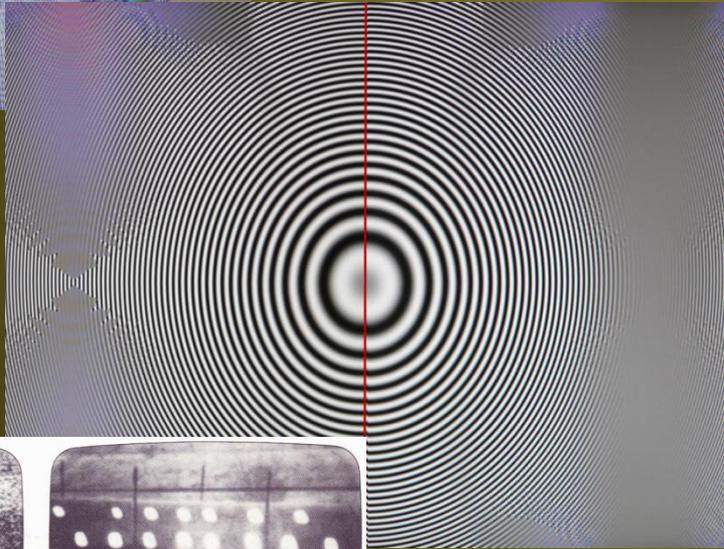
SingMai were the inventors of the HD analogue transmission format now used by companies such as Dahua (HD-CVI) and HikVision (HD-TVI).

Authors of numerous technical articles on video processing.

Exhibitors at major broadcast and security exhibitions.

Speaker at IEEE and CompuSec/Secutech conferences.





BEFORE

AFTER

SingMai Intellectual Property Cores

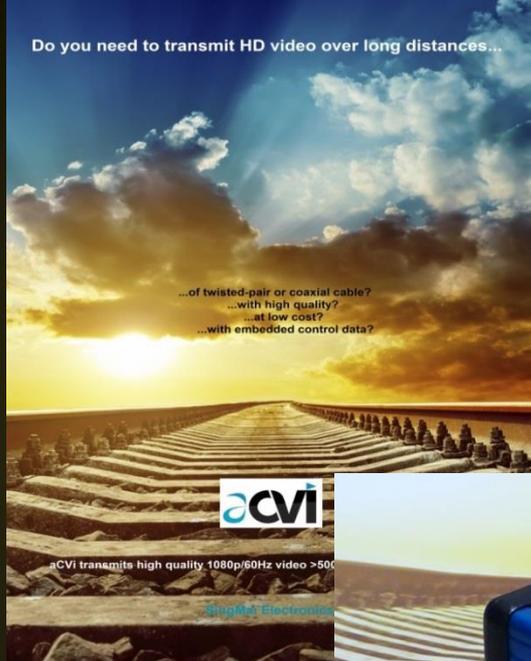
PT8/9 NTSC/PAL broadcast quality video encoder with support for 960H and 1280H formats and cross-colour/cross-luma reduction.

PT4/5 NTSC/PAL broadcast quality video decoder with optional proprietary 3D comb filter.

PT12 3D motion-adaptive noise reduction for SD and HD video.

PT51/55 NTSC/PAL/960H/aCVi decoder and encoder for the long distance transmission of SD and HD video.

PT40: ISP for Bayer image sensors.



aCVi: SD/HD video transport system

Can use low cost coaxial or twisted pair cable.

Distances of >500m for 720p/60Hz resolution.

Graceful degradation of signal quality over extreme distances.

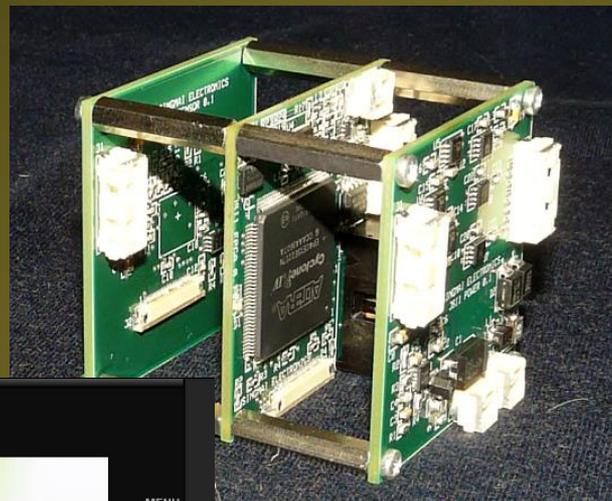
Bi-directional data transfer.

30MHz luma bandwidth.

Test pattern generator and waveform monitors available.

Provided as encoder/decoder IP cores or built and tested modules.

Compatible with other analogue HD formats.



Video Modules

SM09A/D: NTSC/PAL/aCvI and SDI/HD-SDI video pattern generator. Battery operation. 40 patterns including a zone plate.

SM06: aCvI transmitter. Accepts DVI or HD-SDI inputs.

SM08/SM10: aCvI receiver with HD-SDI or HDMI outputs.

SM04D: SDI and HD-SDI picture and waveform monitor. Battery operation.

SM16/SM18: Dual channel HD-SDI <-> aCvI transmitter/receiver for 3D/stereo video inspection.

SM17: HD-SDI synchroniser. Co-times 2 asynchronous video sources for overlay or 3D/stereo multiplexing.

SM11: '3-chip' 960H resolution camera module. No de-Bayer artifacts. Digital and analogue interfaces.

