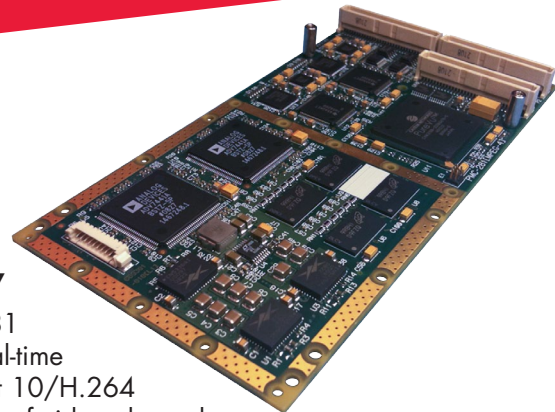# PMC-281

High-definition Real-time MPEG4 Mezzanine

Features

- Dual-channel high-resolution MPEG4 Part 10/H.264 compression and decompression of video up to a resolution of 1920x1080

- Single-channel of 1080p60 encode or decode, or

- Two independent channels, each encoding or decoding at resolutions up to 1080p30/1080i60

- Incoming video is routed directly to the output to provide active loop-through

- Available as a PMC module offering easy integration onto many single board computers (SBCs) and carriers

- Low power design for deployment into harsh environments in a wide range of defense and aerospace applications

- CVBS, DVI and RGB input and output as standard; consult design center for other input/output types

- Programmable compression ratios and downscaling

- Available in turnkey Sentric2-based systems for video recording and network distribution applications

Overview

The PMC-281 provides real-time MPEG4 Part 10/H.264 compression of video channels up to resolutions of 1920x1080 pixels. It is ideal for video distribution and recording applications, where high-compression ratios allow multiple channels of high-definition video to be stored on disks and solid-state media and carried on digital networks.

As a PMC-format mezzanine card, the PMC-281 brings high-performance video compression to a wide variety of system architectures including VPX, VME, CompactPCI (CPCI) and PCI Express® (PCIe).

The PMC-281 uses an ASIC for low power consumption making it ideal for deployment in harsh environments, in platforms as diverse as naval, land vehicle, fast jet, helicopters and UAV.

The two channels of the PMC-281 can be configured for compression or decompression. Each input or output can be independently configured to support single-link DVI, RGB or CVBS.

The PMC-281 loop-through capability is especially useful in recording applications: the PMC-281 can be inserted into the video path so that during compression input video is routed both to the video decoder and to the output.

MPEG4 Part 10/H.264 compression is widely used in commercial and defense applications and users can choose from a wide variety of software decoders as an alternative to the hardware-accelerated decoding of the PMC-281.

Learn More
Web / sales.cwcembedded.com
Email / sales@cwcembedded.com

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Compression

The channels of the PMC-281 can be configured for compression or decompression. In compression mode the video (DVI-D, RGB or CVBS) is captured and compressed by the on-board ASIC. The compressed video is transferred to the host card via the PCI bus.

In addition to being compressed, the digitized video may be looped through to the video output stage, allowing video to be compressed and displayed at the same time. Looped-through video is reconstructed from the original by the codec and is subject to the same frame rate selected for compression. When the PMC-281 is used to decompress video, the output is routed to the same display, thus simplifying system integration.

Decompression

In decompression mode compressed video from the host computer is transferred over the PCI bus to the PMC-281. The card decompresses this video and displays it using the selected output format: single-link DVI-D, RGB or CVBS.

Typical Applications

Many applications have requirements for the distribution or storage of video. Until now, these applications have been challenging because of the combined need for high-compression and high-quality.

MPEG-4 is a very popular compression algorithm with adoption in a wide range of application spaces. Compression allows standard Gigabit Ethernet networks to distribute high-definition video between video sources (such as cameras, sensors and computer graphics cards) and video destinations (such as recorders, image processing units and displays).

For these reasons the PMC-281 is an excellent solution for applications such as:

- Recording the output from surveillance cameras and situational awareness cameras for long durations at high-resolution.

- Recording radar screens and tactical displays for later replay and mission analysis or forensic investigation.

- Video distribution over an Ethernet network on a naval, land or airborne platform to send the output from a sensor to multiple crew stations.

Physical Interfaces

The PMC-281 routes all video input and output via the PMC Pn4 connector.

To facilitate integration, Curtiss-Wright Controls Embedded Computing offers a rear transition module for VME systems and a PMC carrier assembly for PC-based systems.

DVI-I connectors are used on the rear transition module (RTM) and carrier so that standard cables can be used for both analog and digital video input and output. The PMC-281 PCI carrier facilitates the use of the PMC-281 in a PC and provides DVI-I connectors for two channels of input RGB and DVI-D.

Figure 1: PCI Carrier Card for the PMC-281
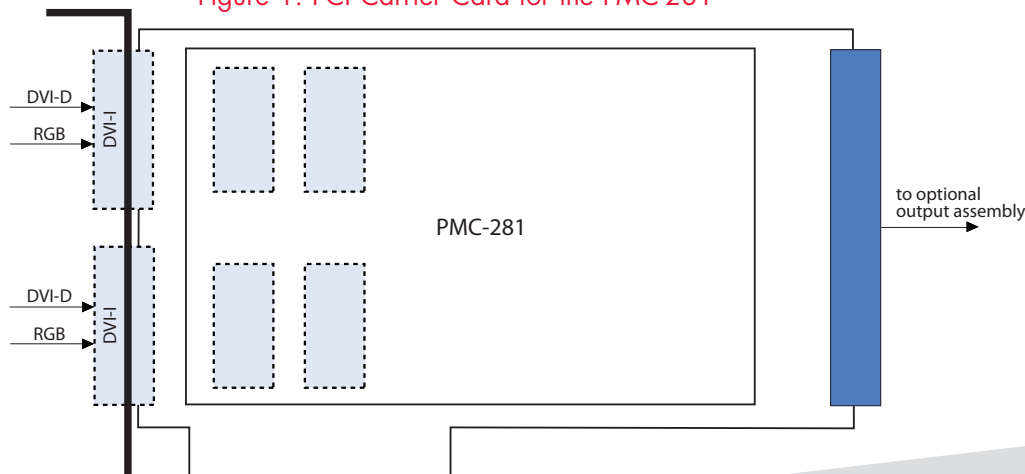
For applications where the PMC-281 will also be used as a decoder, an optional assembly is available. The assembly requires another PCI slot but does not connect to a bus – it requires only a vacant slot on the rear panel of the PC. It provides DVI-I connectors for two channels of output RGB and DVI-D.

The PMC-281 is available as a double-width module with front panel video input and output for applications in benign environments. For more details please see the PMC-287

Figure 2: DVI-I Output Assembly for the PMC-281 Carrier Card
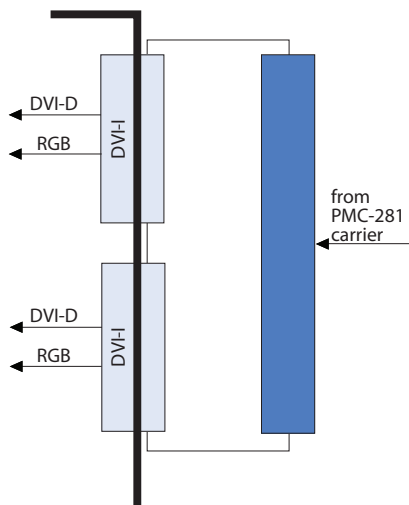
Specifications

Video Inputs

- Two video inputs; each can be:
  - Digital single-link DVI
  - Analog RGB (either separate H/V syncs or sync-on-green, EIA-343 levels)
  - CVBS (PAL/NTSC)
- HDTV and VESA resolutions up to 1920x1080
- Captured video is compressed and transmitted over PCI interface
- Incoming video can be decimated so that one in "n" frames is captured
- Video can be downscaled in resolution to further reduce compressed bitrate loop-through so that incoming video is both compressed and routed directly to the equivalent output

Video Outputs

- Two video outputs; each can be:
  - Digital single-link DVI
  - Analog RGB (either separate H/V syncs or sync-on-green, EIA-343 levels)
  - CVBS (PAL/NTSC)
- HDTV and VESA resolutions up to 1920x1080

Pn4 Pinout

- Two pin-out modes for DVI digital video through the Pn4 connector:
  - One conforming to VITA 46.9 Revision 0.4 P64s pattern where differential pairs on Pn4 are adjacent pins (1&3; 2&4 etc)
  - One where differential pairs on Pn4 are routed as adjacent opposing pins (1&2; 3&4 etc)

Video Compression

- H.264 constrained baseline profile (CBP) up to L4.2 (MPEG4 Part 10/AVC)
- 4:2:2 YUV video coding (downsampled to 4:2:0)

Performance

- One channel of 1080p60, or
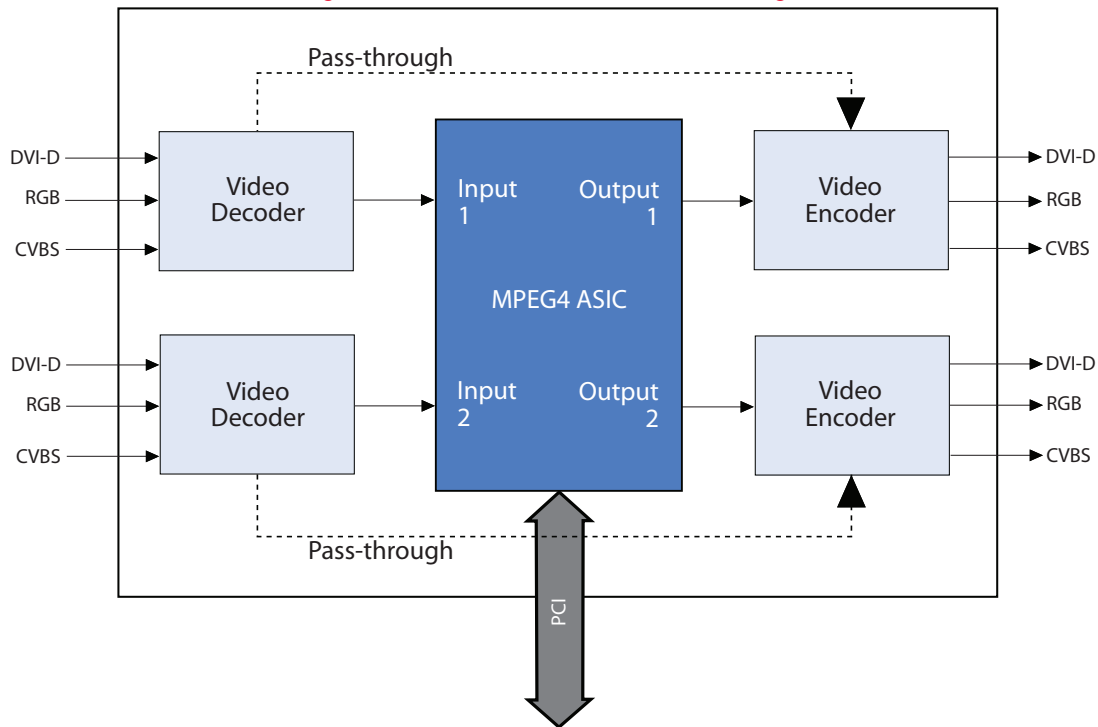- Two channels of video up to and including 1080p30 and 1080i60

PCI Interface

- 32-bit 33MHz PCI
- Power: <2.2A on 5V
- 3.3V PCI Revision 2.2 Compliant Master/Target PMC module
- PCI interface 3.3V and NOT 5V tolerant

Table 1: Dimensions

Size	Weight
PMC card per IEEE 1386.1	<200g (<0.44 lbs)
DPMC card per IEEE 1386.1 (VITA 20-2001)	<200g (<0.44 lbs)

Figure 3: PMC-281 Functional Block Diagram

Pass-through

DVI-D →			DVI-D
RGB →	**Video Decoder**	**Video Encoder**	RGB
CVBS →			CVBS

MPEG4 ASIC — Input 1, Output 1, Input 2, Output 2

DVI-D →			DVI-D
RGB →	**Video Decoder**	**Video Encoder**	RGB
CVBS →			CVBS

Pass-through

PCI

Software Support

- Ubuntu Linux on x86 hosts
- Wind River VxWorks 6.x on PowerPC hosts
- Supported by Curtiss-Wright Sentric2 software in turnkey systems
- For details of interoperability and support for other platforms please contact your local sales representative.

Environmental

- Available in the following Curtiss-Wright environmental grades:
  - Air-cooled Level 0
    - Operating temperature 0°C to +50°C
    - Storage temperature -40°C to +85°C
  - Conduction-cooled Level 200
    - Operating temperature -40°C to +85°C
    - Storage temperature -55°C to +125°C
  - RTMs and PCI Carrier assemblies are Level 0 only
- For further details please refer to cwcembedded.com

Warranty

This product has a one year warranty.

Contact Information

To find your appropriate sales representative:

Website: www.cwcembedded.com/sales

Email: sales@cwcembedded.com

Technical Support

For technical support:

Website: www.cwcembedded.com/support

Email: support1@cwcembedded.com

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