



Data Sheet

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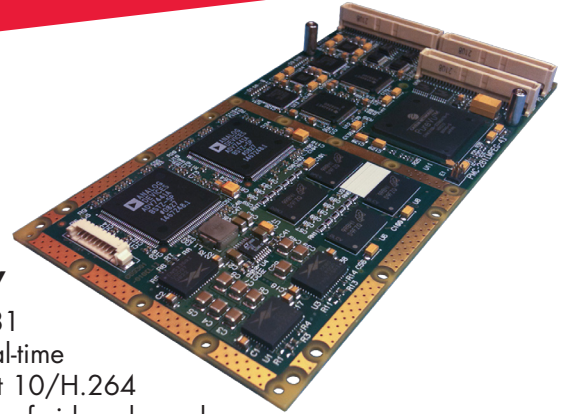
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PMC-281

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
- ◆ Fully integrated into the Sentric 2 and VDS product families for video record, replay and distribution

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.

Each of the two channels supported by the PMC-281 can be independently configured for input (compression) or output (decompression). Each input and output can be configured for single-link DVI, RGB or CVBS.

The 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.

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Compression

One or both of the video channels of the PMC-281 can be configured for compression. In this 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

One or both of the video channels of the PMC-281 can be configured for decompression. In this 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.

Co-processing

The PMC-281 can also function as a co-processor. In this mode, the card's video inputs and outputs are not used. Uncompressed video is fed to the card through its PCI interface and is compressed and transferred across the same interface back to the host processor; decompression is supported in the same manner. This allows the PMC-281 to act as a multi-channel hardware accelerator even when video capture or display is not required. In this mode, the bandwidth of the PCI bus is the only limitation in terms of video resolution, number of channels and frame rate.

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.

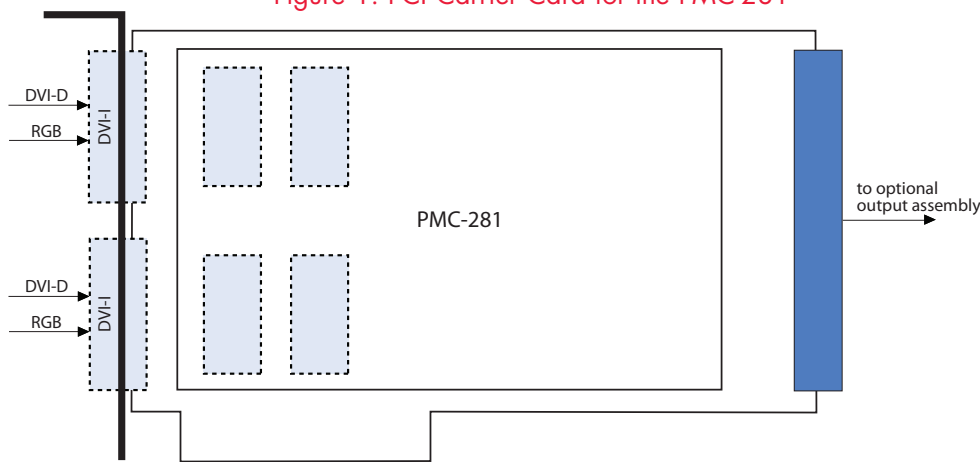
Physical Interfaces

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.

Figure 1: PCI Carrier Card for the PMC-281

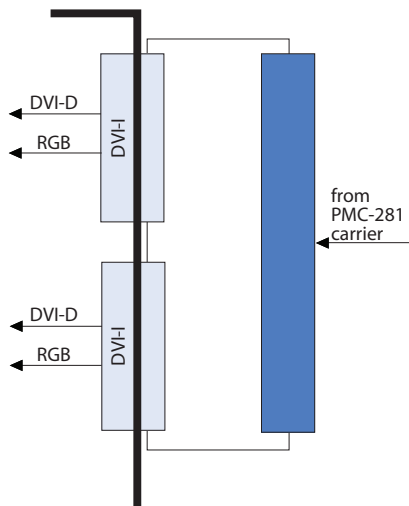




The PMC-281 PCI carrier facilitates the use of the PMC-281 in a PC and provides DVI-I connectors for two channels of input RGB and DVI-D.

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.

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

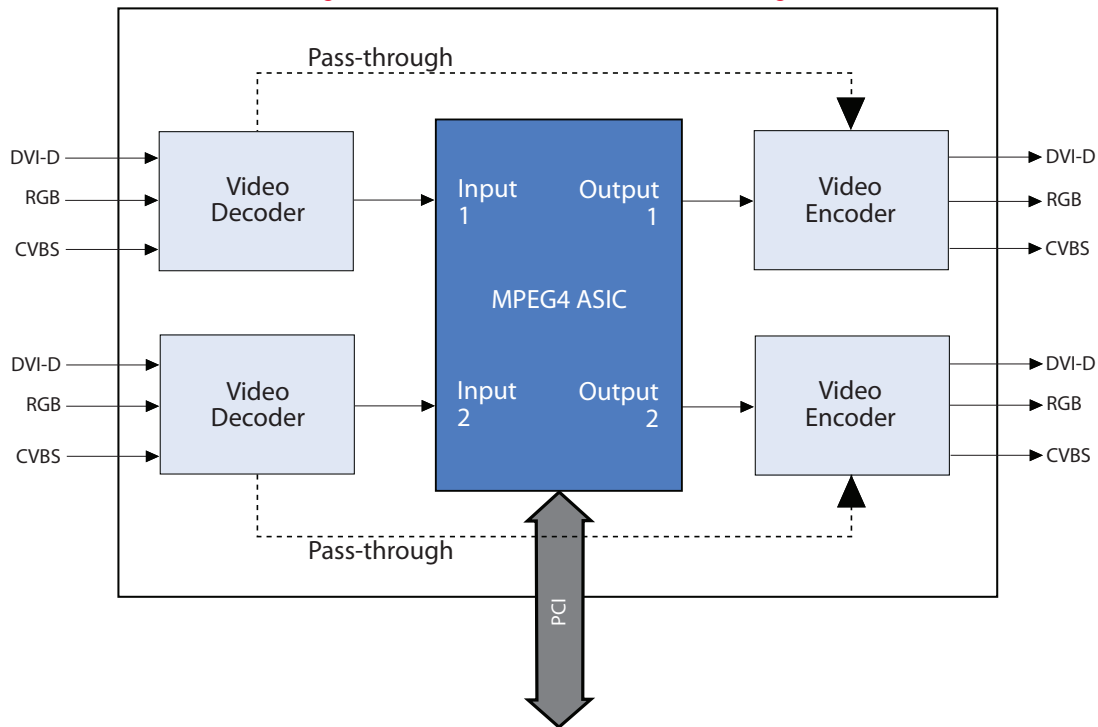
- ◆ 32-bit 33MHz PCI
- ◆ Power: <2.2A on 5V
- ◆ 3.3V PCI Revision 2.2 Compliant Master/Target PMC module
- ◆ PCI interface 3.3V and NOT 5V tolerant

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



Software Support

- ◆ Software support for Windows® and Wind River® GPP Linux® on x86 hosts
- ◆ Software support for Wind River® GPP Linux® and Wind River® VxWorks® on PowerPC™ hosts
- ◆ For support for other platforms please contact the design center
- ◆ Fully integrated into Curtiss-Wright Controls' Video Distribution System (VDS) and Sentric 2 digital recording solution

Environmental

- ◆ Available in the following Curtiss-Wright Controls 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 see the Curtiss-Wright Controls Ruggedization Table at <http://www.cwcembedded.com/0/0/208.html>

Warranty

This product has a one year warranty. An extended warranty may be added when an order is placed.

Contact Information

To find your appropriate sales representative, please visit:

Website: www.cwcembedded.com/sales

Email: sales@cwembedded.com

For technical support, please visit:

Website: www.cwcembedded.com/support1

Email: support1@cwembedded.com

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