MPEG-4 PC-DVR Reference Design Kits

Pentamicro's reference design kits(RDK) for 4 channel PC-based DVR implies a complete solution for the PC-based DVR developers. By using the RDK, the developers and manufacturers can rapidly and effectively develop the 4 channel PC-based DVR system which supports various video compression such as MPEG-4, MPEG-2 and MPEG-1.

Specifications/Features

- 4 channel PC-based DVR solution
  - ◆ 4 channel live monitoring & PCI capture
  - ◆ Windows 2000/XP
- Multi-standard video compression (standards can be differently selected for each channel)
  - ◆ MPEG-4 ASP @ L5 (ISO/IEC 14496-2)
  - ◆ MPEG-2 MP @ ML (ISO/IEC 13818-2)
  - ◆ MPEG-1 (ISO/IEC 11172-2)
- Real-time video monitoring
  - ◆ 1 channel : 720×480(576) @ 30(25)Hz
  - ◆ 4 channel : 360×240(288) @ 120(100)Hz
- Multi-channel video recording (1~4 channels)
  - ◆ 720×480(576) @ 1~30(25)Hz
  - ◆ 720×240(288) @ 1~60(50)Hz
  - ◆ 360×240(288) @ 1~120(100)Hz
- Multi-channel video playback
  - ◆ 4 channel hardware decoding by AT2041
  - ◆ 4 channel software decoding by CPU
- Multi-channel speech encoding/decoding
  - ◆ ADPCM(G.726) or PCM
  - ◆ 4 channel encoding
  - ◆ 1 channel decoding
- Real-time digital watermarking for authentication
  - ◆ Fragile watermark & adjustable strength
  - ◆ Detection of tampering position
- Proprietary motion detection function
  - ◆ Real-motion based accurate detection algorithm
  - ◆ Motion detection area & sensitivity control for each channel
- Video loss detection function

Descriptions

The reference design kit (RDK) for PC-based DVR serves to reduce development time and cost for DVR manufacturers. The RDK provides a complete solution to record and playback single/multi channel video inputs using MPEG-1, MPEG-2 and MPEG-4 standards.

The RDK hardware consists of 4 video decoders, a 4 channel video display & multiplexer (AT4012E), a multi-channel MPEG-4 A/V codec or a multi-channel MPEG-4 A/V encoder (AT2041/AT2043), and a PCI interface chip. The AT2041 (AT2043) compresses input video data from the 4 channel video display & multiplexer, which selects the channel among the multi channels according to the user's recording setup. The encoded bitstream from the AT2041 (AT2043) is sent through PCI interface and stored into hard disk. There are two kinds of MPEG-4 decoding solutions: multi-channel software decoder by PC CPU and multi-channel hardware decoder by the AT2041. The compressed multi-channel bitstream can be decoded simultaneously by one of two decoding solutions.

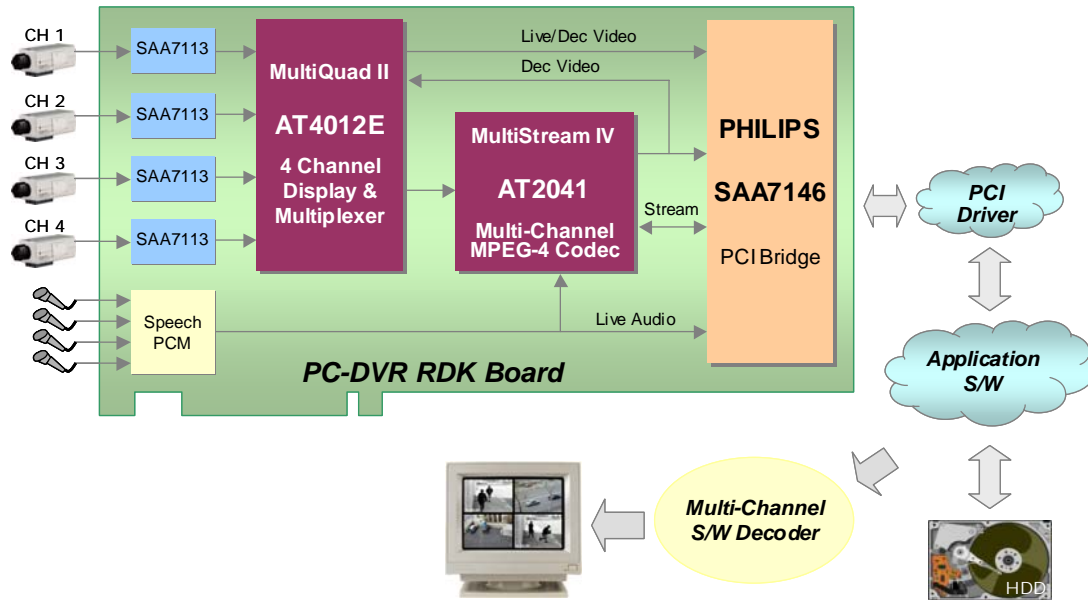The DVR based on this RDK carries the following features:
- Different standards for each channel
- Enhanced image quality using MPEG-4 ASP@L5
- Flexible frame rate control for each channel
- Motion detection control for each channel
- Frame skipping control for each channel
- Real-time digital watermarking
- Multi-channel MPEG-4 H/W & S/W decoding

Reference Board

MPEG-4 PC-DVR
Reference Design Kits

Block Diagram

Deliverable Items

ITEM	RDK-I : MPEG-4 4 Channel PC-DVR (Multi-channel A/V Encoder: AT2043)	RDK-II : MPEG-4 4 Channel PC-DVR (Multi-channel A/V Codec: AT2041)
[Hardware]	• Reference Board (4-ch PCI Add-In Card) • Schematic Diagram for RDK Board • Part List • PCB Job & Gerber File	• Reference Board (4-ch PCI Add-In Card) • Schematic Diagram for RDK Board • Part List • PCB Job & Gerber File

[Software]	• AT2043 Firmware Binary Code
	• PCI Device Driver Source (Philips SAA7146)
	• API (Application Program Interface) Source
	• Application Software for AT2043 Encoding Control
	• Multi-channel MPEG-4 S/W Decoder
	  ◆ Binary Code for MPEG-4 Decoding Core
	  ◆ Source Code for User Interface
		• AT2041 Firmware Binary Code
		• PCI Device Driver Source (Philips SAA7146)
		• API (Application Program Interface) Source
		• Application Software for AT2041 Encoding Control
		• Application Software for AT2041 Decoding Control
		• Multi-channel MPEG-4 S/W Decoder
		  ◆ Binary Code for MPEG-4 Decoding Core
		  ◆ Source Code for User Interface

[Documents]	• AT4012E & AT2043 Data Sheet • Hardware Manual • Application Software Manual • User's Manual	• AT4012E & AT2041 Data Sheet • Hardware Manual • Application Software Manual • User's Manual
[Additional Software for Embedded DVR]	–	• AT2041 Linux Device Driver • AT2041 Linux API • AT2041 Test Application Software