![Texas Instruments logo](TEXAS INSTRUMENTS)

Video Scaling Example on the DM642 EVM

DSP Catalog/EEE

ABSTRACT

The video scaling example demonstrates the real time video rescaling on DM642 EVM. The input video frames are scaled in different sizes and displayed on a VGA monitor. Project collateral discussed in this application report can be downloaded from the following URL: http://www.ti.com/lit/zip/SPRAA57.

Contents

List of Figures

1   Software Architecture/Data Flow

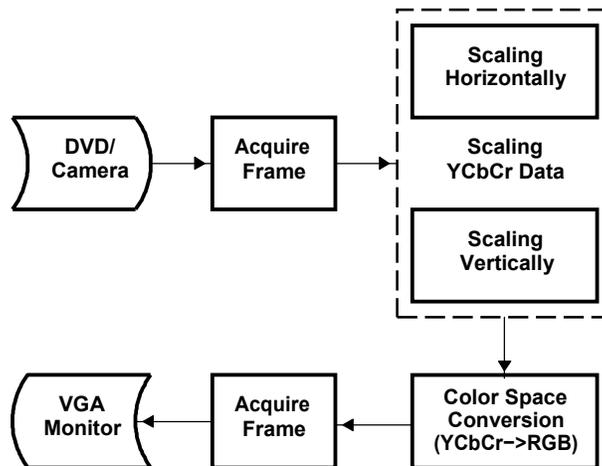DVD/camera -> acquire frame -> scaling -> color space conversion -> display frame.

Figure 1. Software Architecture and Data Flow

1.1   *Dataflow diagram for the demonstration*

The data flow in the demonstration follows the following sequence:

- Stage 1: A frame is captured from the input source (DVD/camera).
- Stage 2: The acquired frame data which is in YUV4:2:2 is rescaled horizontally/vertically.
- Stage 3: The rescaled data which is in YUV4:2:2 format is converted to RGB565 format.
- Stage 4: The RGB565 data is send to the VGA monitor for display.

1.2 Framework flowchart

The demonstration uses a single unified task to handle video capture, video rescaling, color space conversion, and video display.

Before coming to the BIOS task scheduler, the demonstration code performs initialization of various modules used in the system. These include:

Board and processor initialization:
- The system performs BIOS initalization and CSL initialization.
- The L2 cache mode is set to 128K cache.
- EMIF CE0 and EMIF CE1 space are enabled for caching.
- Sets the DMA priority queue low.
- DMA manager is initialized with allocated internal and external heap.

Creation of capture and display channels:
- An instance of capture channel is created and started.
- An instance of display channel is created and started.

After these initializations, the system enters the processing task.
- "FVID_exchange" provided by the driver acquires a frame from the NTSC input device. The acquired frame is in YUV4:2:2 format.
- Rescaling ratio is updated every four frames.
- Rescale the video frame.
- Convert the rescaled video frame from YUV4:2:2 format to RGB565 format.
- "FVID_exchange" provided by the driver displays a frame on the VGA monitor.

2 System Requirements/Configuration

2.1 Software Requirements
- Microsoft Window XP NT (SP6)/Microsoft Windows 2000 (SP1 and SP2)
- Code Composer Studio™ Integrated Development Environment (IDE) version 2.21 or greater

2.2 Hardware Requirements
- Pentium Machines with 450 MHz, 64 MB RAM (minimum)
- DM642 EVM
- Computer monitor for VGA display
- Camera/DVD for NTSC captures purpose
- XDS 510/560 emulator

3 Demonstration Code and Build Procedure

3.1 Directory Structure

This example is located at:

Figure 2. Example Location and Directory Structure

3.2 Build Procedure

1. Start Code Composer Studio version 2.21.
2. Open the "scaling" project (scaling.prj) in the examples\video\scaling folder.
3. Go to Project -> Build and rebuild the project.
4. Build the project and load the executable from the VGA_LOOPBACK directory "video_vga_loopback.out".
5. Press F5 to run.

IMPORTANT NOTICE AND DISCLAIMER