

### Introduction

Altera provides the VIP (Video Imaging and Processing) Suite to address a wide range of video applications. It consists of building blocks which can be chained together to provide the required functionality. However, for high-end applications which require 3D and/or audio additional features are required. Although multiple independent pipelines could be configured, there is no way to guarantee that they remain synchronized. If any glitch were to occur, either during startup or during a long movie, video frames and/or audio could slip out of sync.

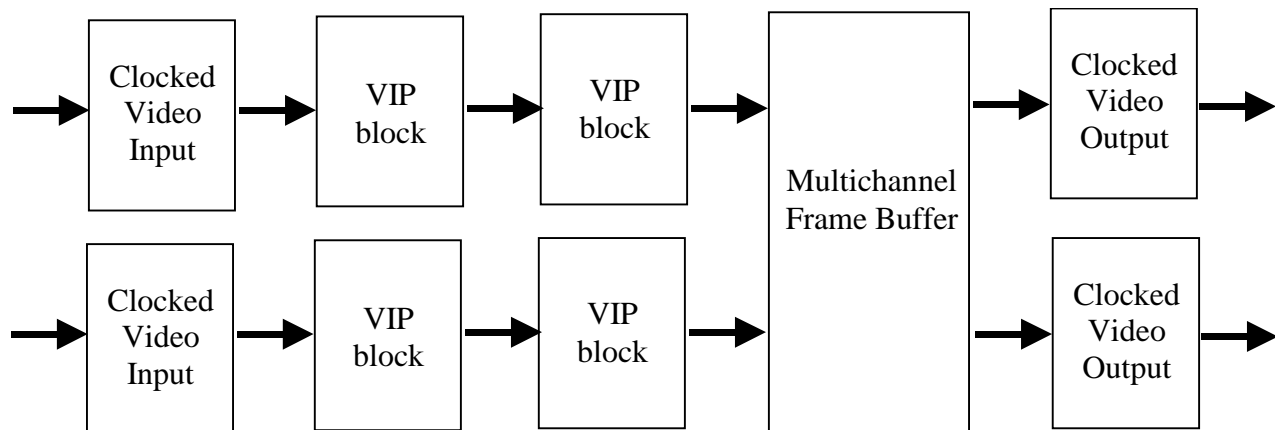
Octera provides building blocks which resolve these issues. The concept of frame numbers is introduced, along with a new Frame Buffer which outputs frames with matching frame numbers. If anything goes wrong with the input video stream, such as duplicate frame numbers, missing frames, frame numbers jumping to a new sequence, etc., the Frame Buffer employs algorithms which match frames as closely as possible, and which also

guarantee that matching frames will, once again, be sent as soon matching frames arrive on the input.

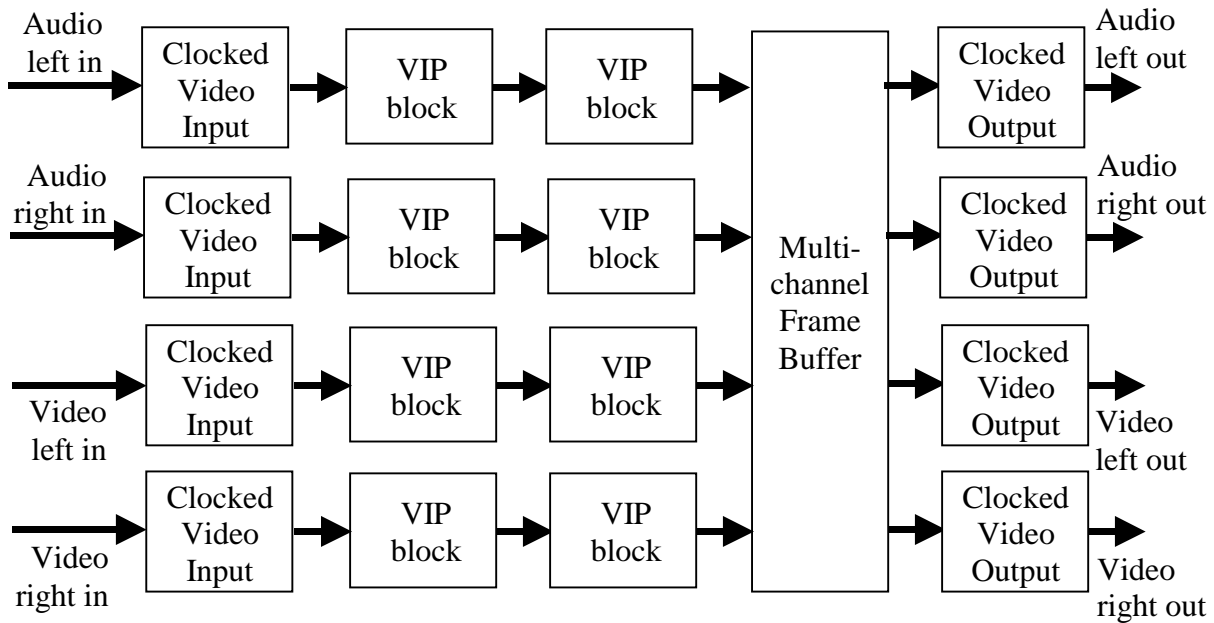
Other modules are also available which insert frame numbers into the VIP suite's packet stream and enable audio streams through the VIP suite.

### Features

- Multi-channel frame buffer
- Adds frame numbers to video frames
- Sends output frames with matching frame numbers whenever possible
- Re-aligns frames when sync is lost and sync becomes possible again
- Converts streaming audio into packets to be handled by the VIP subsystem, and converts those packets back to streaming audio
- Keeps 3D video in sync
- Keeps audio in sync with video



Basic 3D VIP subsystem



3D VIP subsystem with stereo audio

### Implementation Summary

Example Resource Utilization and Performance	
	<i>Stratix IV*</i>
Logic	4.4K ALUTs
Registers	4.5K
RAM	21 M9Ks
Speed	200 MHz
Supported Design Tools	
Altera	Quartus II
Mentor	ModelSim

\* This IP is suitable for use in all Altera device families.

### Customization

Octera can provide processing blocks such as video encryption and decryption, video interfaces, audio filters, audio interfaces, interfaces to cameras and displays, etc.

### Deliverables

- Encrypted source code
- Fully synthesized FPGA

**Product code: OCT-VIDEO-3D**