



Impulse Ready-to-Run Example

## Accelerating MPEG2 Decoding on a Xilinx ML403 Board

Impulse Accelerated Technologies, Inc.

[www.ImpulseC.com](http://www.ImpulseC.com)

### Overview

This ready-to-run example demonstrates how to use Impulse C to create an accelerated MPEG2 decoding application using a Xilinx ML403 development board, the Xilinx EDK tools and the embedded Xilinx PowerPC processor. The methods used in this example can be applied to many similar embedded PowerPC applications.

This example assumes some knowledge of the Xilinx EDK tools. For a detailed description of how to use Impulse C with the Xilinx EDK tools and the PowerPC processor, please see the tutorials installed with your Impulse CoDeveloper tools, in the Help and Support section of the Start Page.

### Example Notes

Impulse C can be used to generate hardware modules that are directly connected to an embedded processor (such as the Xilinx PowerPC) or to other hardware elements that may have been described using other design tools or techniques. The Impulse C programming model emphasizes the use of data streams, signals, and shared memories for process-to-process communication. These interfaces can be used to connect Impulse C processes to a wide variety of hardware devices and processors.

For the PowerPC embedded processor, there are multiple possible ways to provide communication between a software application running on the processor, and a hardware accelerator running in the FPGA fabric. These include:

- Using the PLB bus to create an Impulse C peripheral on a shared bus
- Using the APU interface to create a high-speed data stream
- Using shared memory

This example demonstrates a streaming application, using the APU and two distinct accelerated hardware processes. The two hardware processes are:

- YUV Color Conversion
- Discrete Cosine Transform

In this example, a software application running on the PowerPC communicates with the hardware accelerators using Impulse C API functions/macros, which are implemented by the Impulse C compiler using the APU.

## Project Files and EDK Settings

### ZIP File Directory Structure

|                 |  |
|-----------------|--|
| MPEG2_ML403.PDF | (This document)                                  |
| MPEG2_ML403.ZIP | (Impulse C project source files and EDK project) |

### Hardware Platform

Xilinx ML403 development board

### Software Versions Used

Impulse CoDeveloper Version 2.20  
Xilinx ISE Version 8.2  
Xilinx EDK Version 8.2

### Impulse C Platform Support Package

Xilinx Virtex-4 PowerPC APU