

# T-G-C electronics design

## Case Study 2:

### Fibre Interface for Digital Movie Camera – East meets West.

#### The Challenge

A respected European manufacturer of 35mm movie cameras wished to hook up its flagship digital camera via an optical fibre link to a video recorder manufactured by a well-known Japanese company. Additionally, variable frame rate capture was required for special effects such as wildlife filming. Both companies had their own, and very different, video and control interface protocols. We were asked to design a box of tricks that would mount on the camera to connect between the camera, via a long length of fibre optic cable, to the recorder. The interface had to mount on the camera as an accessory, be robust enough to withstand daily rigging and de-rigging, and operate in both frozen and desert conditions whilst being only convection cooled.

#### TGC's Solution

First, we put Non-Disclosure Agreement in place, and looked at both manufacturer's interface protocols. You know how some engineers never quite get around to documenting things clearly... We chose a mid-range Altera FPGA as the core of the interface design, with 64 bit DDR2 video frame buffer memory attached. The frame buffer was necessary to handle the variable frame rate data arriving from the camera before it was repacked with control signals for the recorder. The memory controller was of our own design, optimised for video applications. The optical interface to the recorder necessitated specifying custom WDM combiners.

We were also responsible for the mechanical design of the product which needed to match the "look and feel" of the camera. We supplied complete tested units to the camera manufacturer, ready to use on set!

#### Highlights of the Design

- SDI Fibre Optic interfaces using WDM.
- Altera FPGA with attached 64 bit wide DDR2 memory.
- High speed controlled impedance PCB layout BGA packages & DDR trace length matching.
- VHDL coding & simulation for FPGA.
- Atmel microcontroller.
- Excellent EMC performance
- Robust mechanical design.

Click [here](#) to see Case Study 3: Short term assignments - Another pair of eyes.