High speed multichannel camera with 10 Gbps interface

inż. Piotr Zdunek
dr inż. Grzegorz Kasprowicz

Warsaw University of Technology
Faculty of Electronics and Information Technology
Institute of Electronic Systems
Photonics and Web Engineering Group

April 30, 2015

Typical camera overview

Typical camera mainly consists of:

- optics
- shutter
- electronics
- shutter release
- sensor
- display

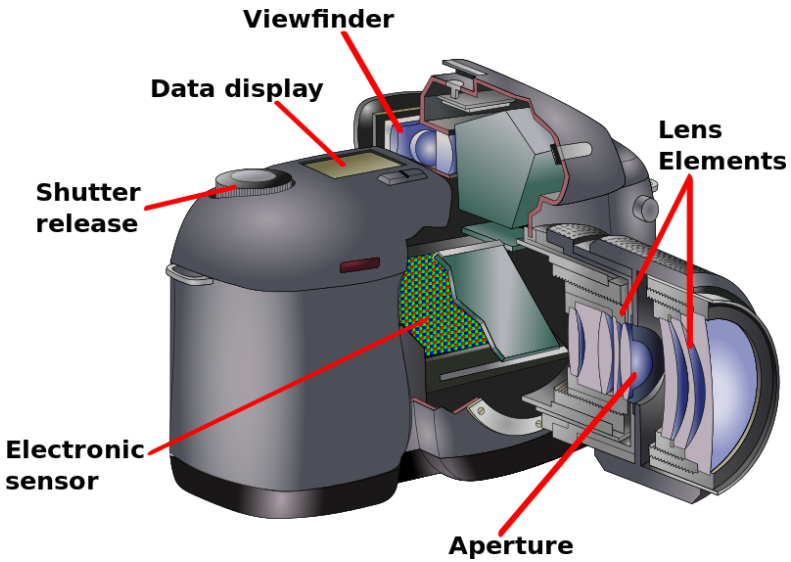

Figure : Example of camera system

Scientific camera overview

Scientific camera adds:

- multichannel operation
- high speed interface
- sophisticated sensor
- remote control
- no display :(

Figure : Pi of the sky camera system

Genesis

- there is no open framework for camera design
- all designs are custom
- long and tedious development
- solution?


Goal of the master thesis

The goal of my thesis is to design a firmware for a scientific camera with the following requirements:

- high processing performance - for support of high resolutions
- ease of adding a support for a different sensor
- high speed communication - to send high amounts of data live
- multichannel operation - astronomical as well as medical applications require it


Concept of realization

Figure : High speed multichannel camera block diagram

dummy



POLITECHNIKA WARSZAWSKA
WARSAW UNIVERSITY OF TECHNOLOGY

ise

dummy



POLITECHNIKA WARSZAWSKA
WARSAW UNIVERSITY OF TECHNOLOGY

ise

dummy



POLITECHNIKA WARSZAWSKA
WARSAW UNIVERSITY OF TECHNOLOGY

ise

dummy



POLITECHNIKA WARSZAWSKA
WARSAW UNIVERSITY OF TECHNOLOGY

ise