Eletronics Engineering Honours Projects 2009
Proposed by

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Versions.02

Notes:- **1. These ideas are the property of Karl Reed until a student agrees to undertake them.**
2. The projects may have commercial value, especially No. E1. We will need to reach an agreement on sharing the results of the IP in accordance with La Trobe University Regulations on such matters.

Project E01. 100mw mains supply standby controller.

It is currently estimated that the average Australian house is consuming 60-80watts of main's power continuously due to the standby power requirements of typical domestic appliances. The result is that for a large city like Melbourne, with around 1.4 million households, the continuous standby consumption may be more than 100Mw[1] There is an international proposal for a "standard" of 1 watt standby consumption per device by 2012. (Your job to find the references).

The objective of this project is the design and demonstration of a standby controller with a maximum consumption of 100mW or less, with a production cost equal to or less than current standby controllers.

Part of the project is to review the current state of the literature and data on this issue, and to document current international trends and associated current and projected standards.

The project could also be extended to having a "connectionless" system in which these controllers could communicate with each other so that one of a number of "master" controllers can activate-deactivate slaves. (One solution could be signaling over the 240v wiring in a house).

[1] The average standby consumption used is based on a Queensland survey.

Project E02. Digital Imaging Backs for 35mm Film Cameras

Developments in digital photography now mean that the best digital cameras can match all but the best film in terms of image quality and resolution. Even so, there must be millions of people around the world who have made significant investments in high-quality film cameras some with removable backs. (Part of the project is to address this issue also.. replacing backs).

In many cases, the lenses available for these film cameras from makers such as Ziess, Nikon, Canon, Minolta and Olympus (to name a few) constituted a very major investment. They are often far better than the cheaper lenses provided with even high-end digital cameras[2].

There is, therefore, a primafaci market for "digital backs" that will enable the owner of a good high-end film camera to migrate to digital imaging without having to throw away their lenses. (Hasselblad offer backs which they claim will operate with "*…The CF is easily attached to most professional medium-format SLR cameras and view cameras on the market…"* [Hasselblad 2008]).

Of course, there are interfacing problems which need to be solved. For example, transmitting user selected ISO to the "back", or from the "back" to the camera. Autofocus should not be an issue, since the camera bodies already do this, so the back will not need to have logic for this. The extent to which camera metering modes need to be shared also needs investigation.

I suggest that the "back" actually be as simple as possible. Current digital cameras have very large numbers of options. Most are of no interest to a film-shooter. An important design question is…….

What is the minimum set of functions that are actually necessary?

[2] I have a set of Ziess lenses for a Contax G1. None of my top Nikkor lenses are as good as these..)

This project is to produce a generic design with interfaces that can be readily adapted for a range of high-end 35mm film cameras. A number of issues need to be explored in addition to those already mentioned.

E.G.:-

a/ Sourcing of sensors,

b/ Whether the basic logic and sensor can be set up so that they can be fitted to different cameras? That is, can we develop a "kit" for manufacturers to use.

c/ How much of the image quality related logic in a current digital camera can be treated in a product-line manner?

Of course, there will be more issues, these are just a few..

References

[Hasselblad 2008] CF and CF-MS Digital Backs
http://www.hasselblad.com/products/backs/cf-and-cf-ms.aspx

