

PICit – PC based camera

For the industry partner Brunner Elektronik AG, the institute of electronics (IfE) developed successfully the world smallest PC based camera - PICit.



Motivation

The company Brunner Elektronik AG develops control systems for various applications. One of their key operational fields is image processing for print processing automation. High speed cameras monitor and control documents, papers as well envelopes passing with a speed up to 2 m/s through optical character recognition (OCR), barcode and 2D-codes recognitions.

This market field is very strong growing and Brunner Elektronik AG required a development of a new, faster and more powerful high speed camera. To avoid picture processing to be done in an additional separate unit and therefore extra cost for high speed interfaces, the image processing power unit with the image sensor were integrated in one compact body – the PICit.

Description

The standard hardware bases on PC technology, consisting of a 700MHz Pentium III, 256 MB RAM, a Hard-Disk, Compact-Flash® slot and LAN, USB and RS232. This modular concept allows a very easy performance upgrade of the computing power by simply plugging in another Pentium module or more RAM for example. Because of the fan-less, reliable and modular hardware, PICit is the ideal product for various process automation applications. Another strong argument of the PICit is the availability of different running operation systems and with this the usages of very established imaging libraries like Matrox MIL® or Neurocheck®.

Industrial image processing in this application field demands for asynchronous image capture triggering and the ability to cope with very high image contrasts. The evaluated CMOS sensor fits perfectly those demands; it is featured with global shutter technology and the sensors sensitivity can be adjusted continuously by software from linear to logarithmic.

Special effort was made to support the bandwidth needed for the high picture frame rate. Because the PC standard interface Firewire® and PCI Bus would support only data transfer rates of 100 MB/s, the Institute of Electronics designed a specific interface to the PCI Bus which already includes image pre-processing algorithms as well as peripheral functions.

Results

In 2003 the PICit camera with the dimensions of 80 x 55 x 145mm is the smallest high speed camera with integrated PC on the market. With a resolution of 1024 x 1024 Pixel the system is able to run up to 100 frames/s and the exposure speed can be programmed down to microseconds. With PICit a reliable and very modular camera with integrated PC power has been realized.

Project PICit

Project Partners

Brunner Elektronik AG ,CH-Hittnau
www.brunner-elektronik.ch

Project Duration

18 months

Project Budget

CHF 300'000

Contact Person

Ronald Vuillemin
rvuillemin@hta.fhz.ch

