Miniature Computer built with Compact Flash Cards

Why?

The Common Problem

You need to build a miniature embedded computer.

You need to use standard, commercial of the shelf components (COTS) to keep development costs low.

It needs to be flexible to cater for your customers vague and changing requirements.

The Common Commercial Solution

Simple.

Trawl the web to find a suitable embedded platform with the right range of expansion cards from a range of suppliers.

You will most likely have selected a PC104 solution.

You start building your PC104 stack, processor with integrated data acquisition, CAN and power supply.

This should fit in a 5.5*5.75*3.0 inch (14.0*14.6*7.6cm) Pandora Enclosure System (www.diamondsystems.com), 2nd from the left.

If that fits you space, then you have your solution.

Solution way too big

If this is still to big, what next.
You still cannot afford custom hardware solution.

During your web trawl you have repeatedly found National Instrument (www.ni.com) and other Data Acquisition Cards in PCMCIA format 2.125*3.375*0.2 inches

(54*85*5mm). You have a PCMCIA ethernet card in your laptop. So why can't I plug my PCMCIA DAQ card and PCMCIA ethernet card together and have a miniature system 2.125*3.376*0.4 inches. You can plug them together. Its called your laptop.

A PCMCIA/PC-CARD Solution

If a processor card in PCMCIA size existed, then this would solve the space problems. A complete system built out of PCMCIA cards 2.125*3.376*0.6. Once cased up with a back plane, slightly larger, 2.5*3.75* 1.0 inches. Connector's a bit of a problem.

PC104 Solution 5.5*5.75*3.0 = 94.8 cubic inches
PCMCIA Solution 2.5*3.75*1.0 = 9.4 cubic inches
(plus the connector)

That's a system built out of commercial off the shelf components approaching 1/10 the size of the PC104 solution.

This sounds like a good idea, and something that a quite a few developers would like.

An even better solution

But wait a minute. Isn't there a smaller card than PCMCIA, yup, Compact Flash.

What cards are available?

Ethernet, 802.11b, Bluetooth, RS232, storage and a DAQ card. So most of the things PCMCIA provides, Compact Flash provides, but the choice is a bit smaller.

Lets do the size calculation again.

Compact Flash Solution 1.75*2.0*1.0 = 3.5 cubic inches

That's approaching 1/30 of the PC104 solution!

This really now looks a revolutionary step in building embedded systems. Custom miniature embedded systems that can be built with 3rd party off the shelf cards.

What's the downside of a Compact Flash processor.
Lets adopt a standard form factor for such a processor, Compact Flash seams like a good choice.

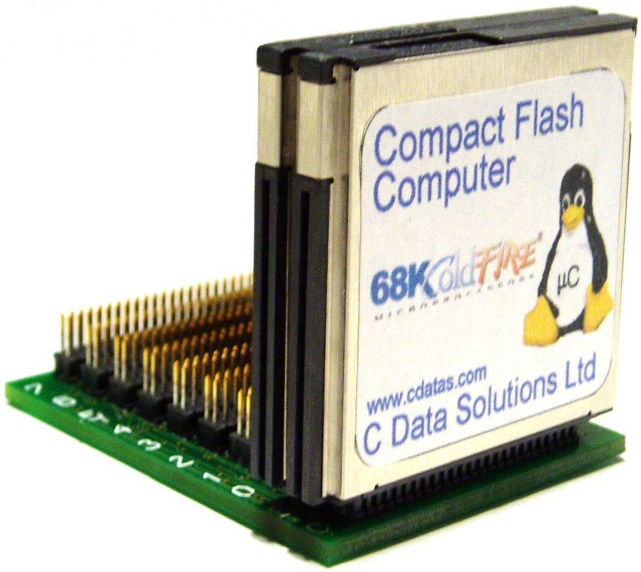
It's small, the obvious problem is how much processing power can we put in there, but then how much do we need?

A survey of embedded systems produced numerous candidates. The smallest with uclinux support was the Coldfire mcf5272, 15mm*15mm. This may fit on to a Compact Flash card, with FLASH and RAM. This processor is used by numerous company for embedded products running uclinux, so its obviously powerful enough for many applications.

So what next.

Can it be built, and can it manage multiple Compact Flash cards.

Yes. And here it is.



Web: www.cdatas.com
Email: info@cdatas.com