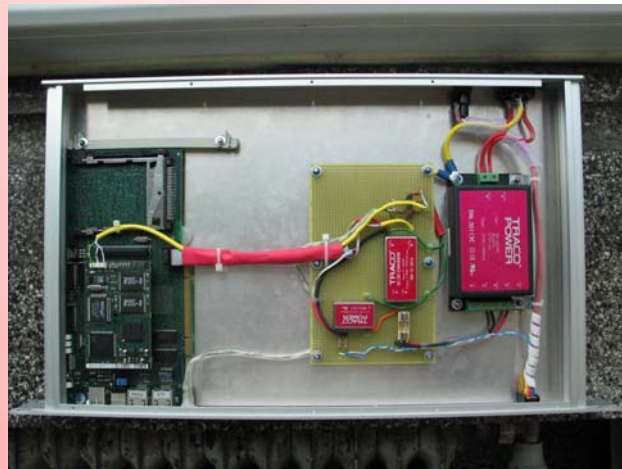


The MicroIOC

First customer:

SLS @ PSI

In 2003



From Custom

25 pieces for Australia

Spring 2005



To Production

mark.plesko@cosylab.com

Oct 6-7, 2005

EPICS Collaboration Meeting – Archamps, France

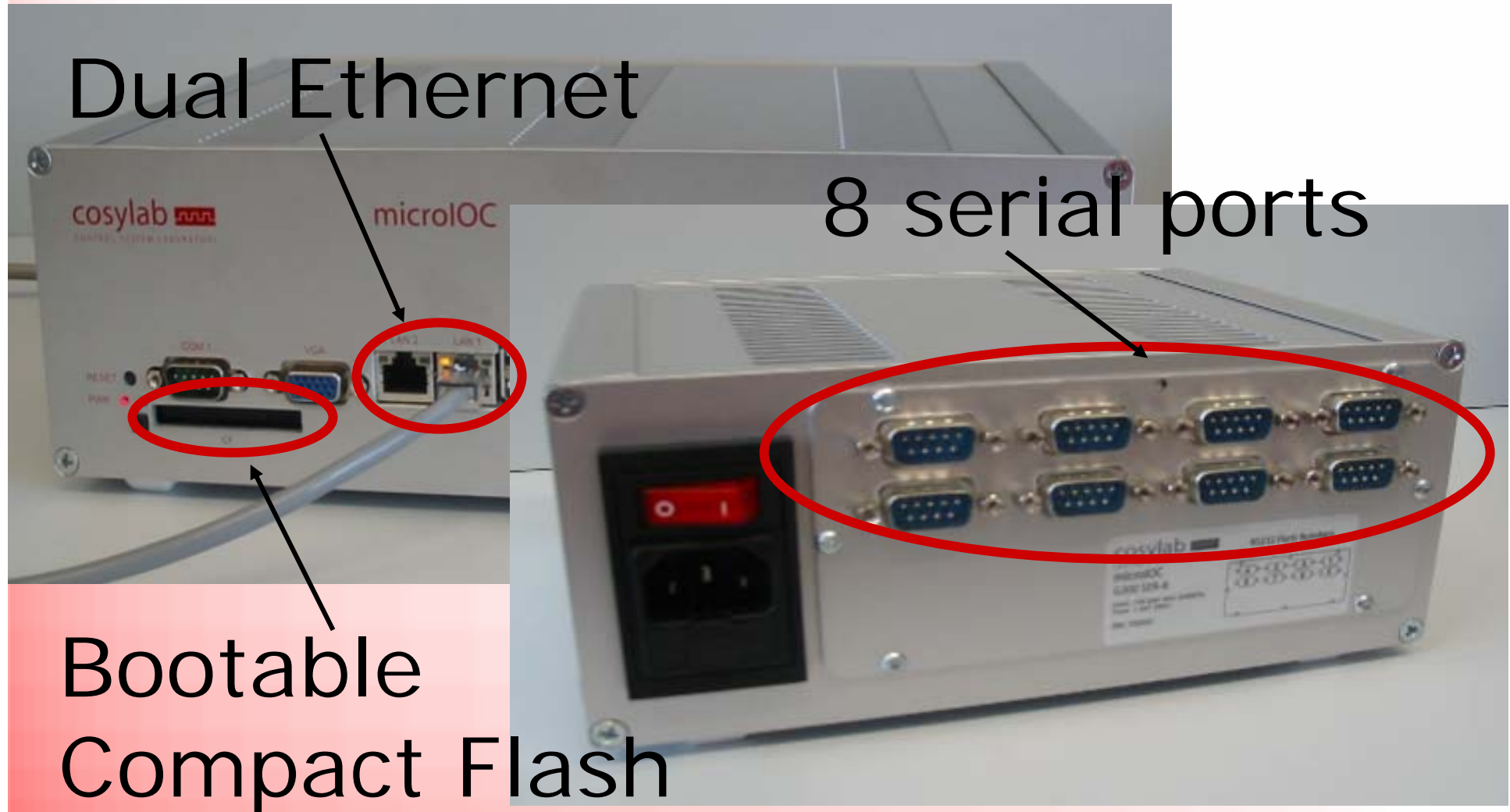
Dilemma

- Marketing or technical presentation?
 - We sell those things
 - We're proud that we designed them
- Asking **YOU** for advice:
 - Is it a good idea?
 - Does it solve people's needs?
 - Which types or microIOCs are useful?

The microlOC Concept

- Signals in, EPICS/CA out
 - A smart "black box" IOC
 - attach motors, serial and GPIB devices
 - plug&play, no building, configuring, etc.
- Offer EPICS devices
 - E.g. EPICS scope, EPICS motor controller
- Use it stand-alone at accelerators, beam lines and other experimental systems, where VME would be overkill

microIOC – Second Generation in 2004



What the User Wants:

- The microIOC is a black box for installation:
 - with a built-in EPICS database
 - already with preconfigured records
 - everything must be very user friendly, with wizards, in a plug&play manner..
- And made of standard components:
 - a reliable power supply (55 years MTBF)
 - an onboard PC104(+) linux/RTEMS processor
 - Off-the-shelf parts to replace
 - No moving parts (fan, disk) to break in first place

The microIOC Family

- Small 9"
- Display 13"
- Rack mount 19"



Integrate Devices into EPICS



USB/Ethernet camera



GPIB

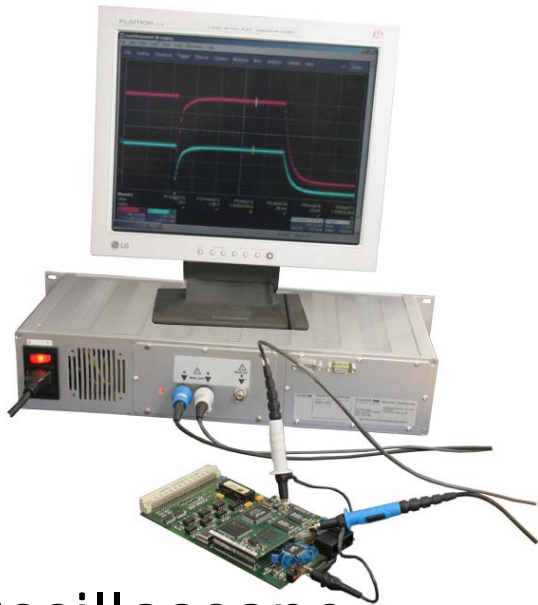


RS 232/422/485

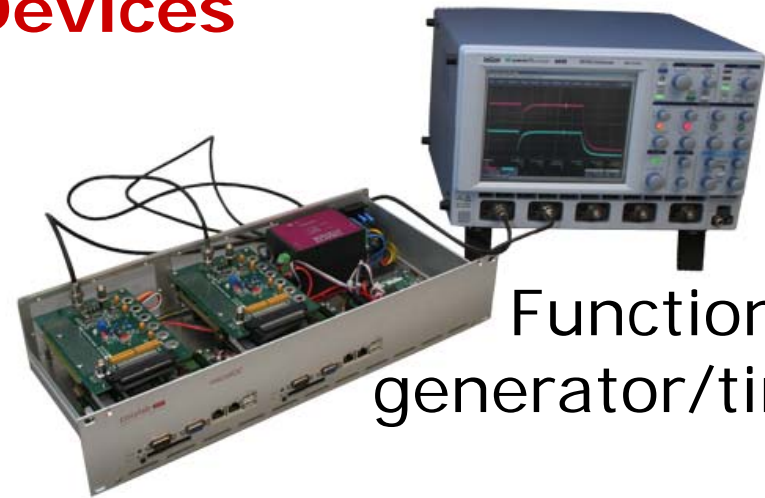
Analog/digital I/O



EPICS Devices



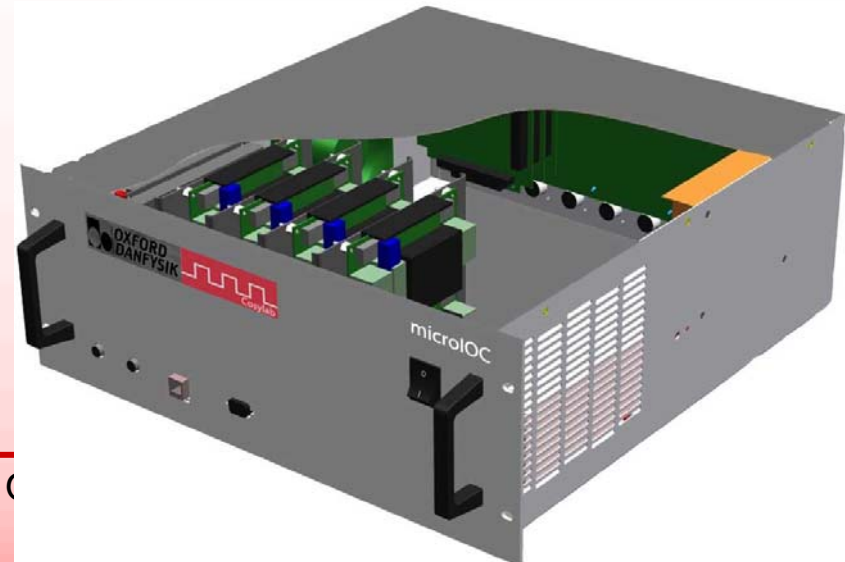
Oscilloscope



Function generator/timing

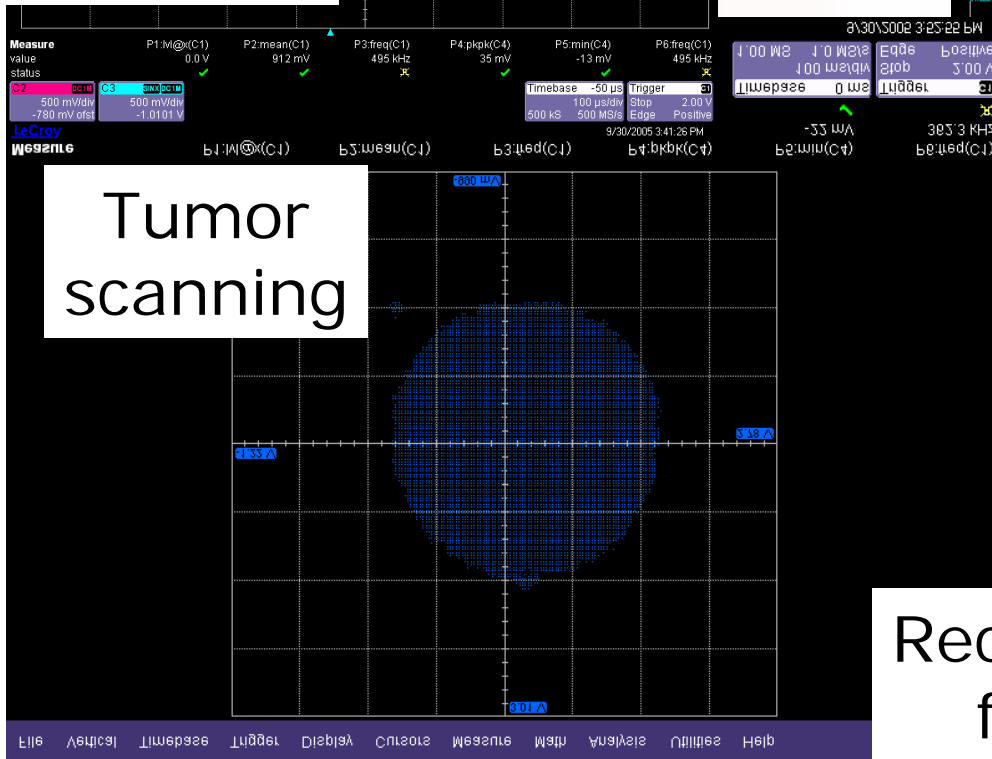
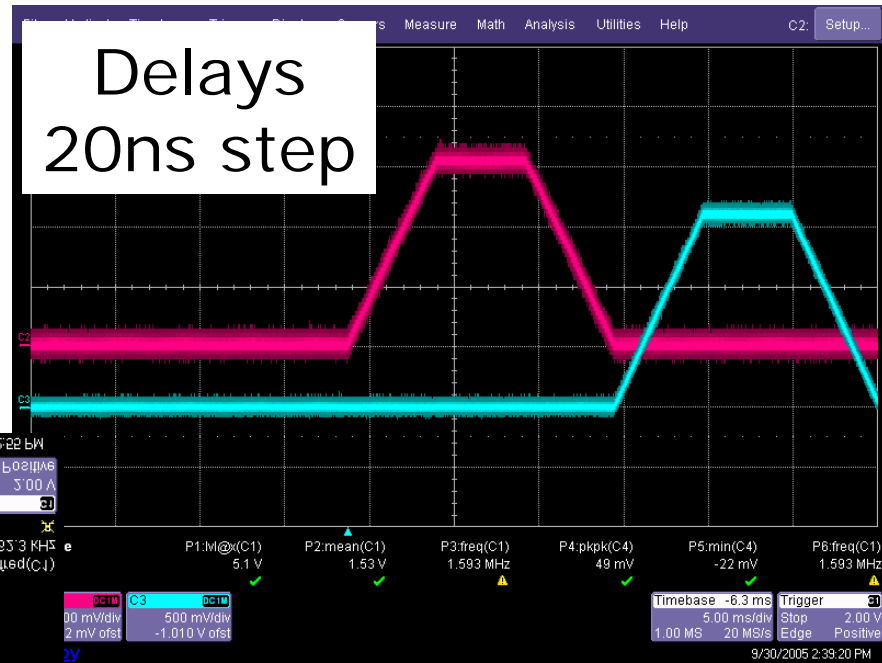
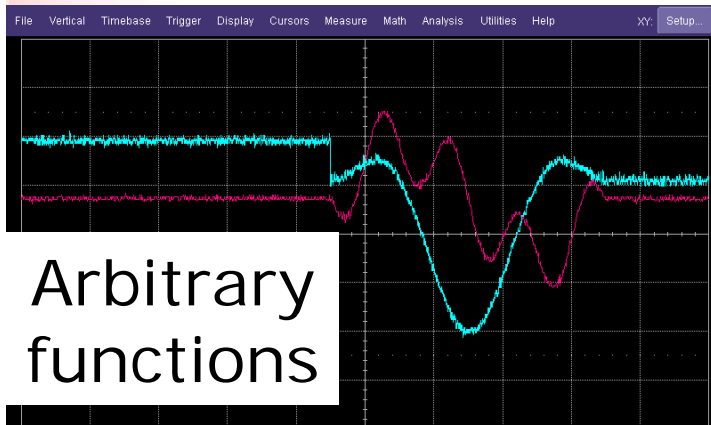
Motor controller/driver

Danfysik power supply

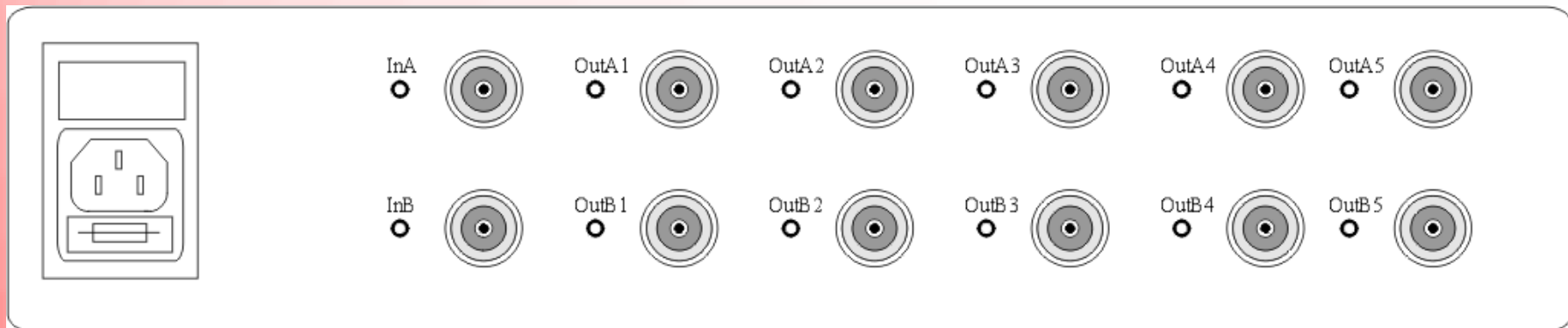
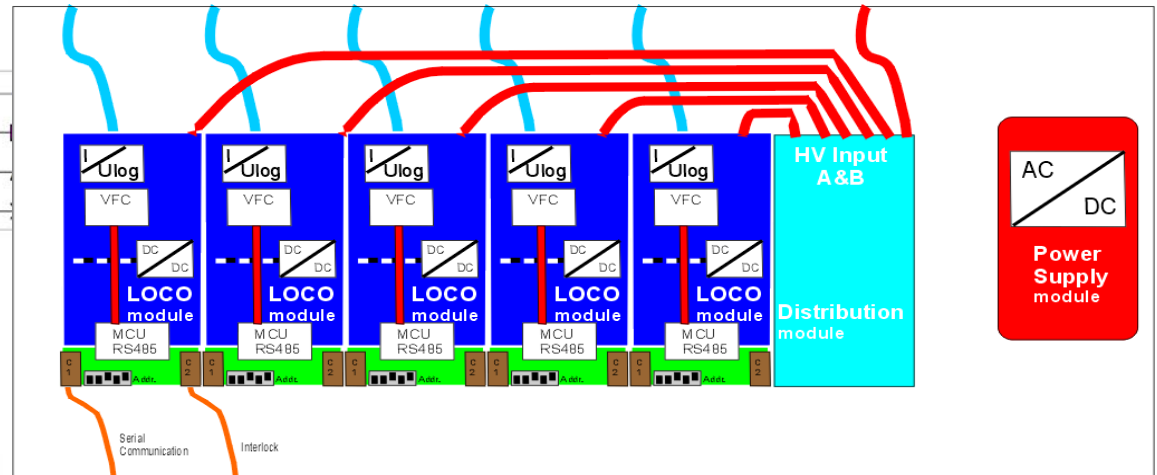
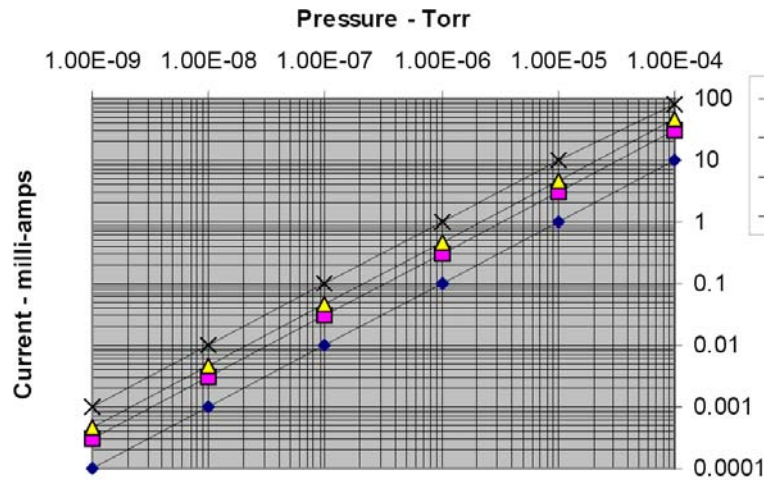


mps, C

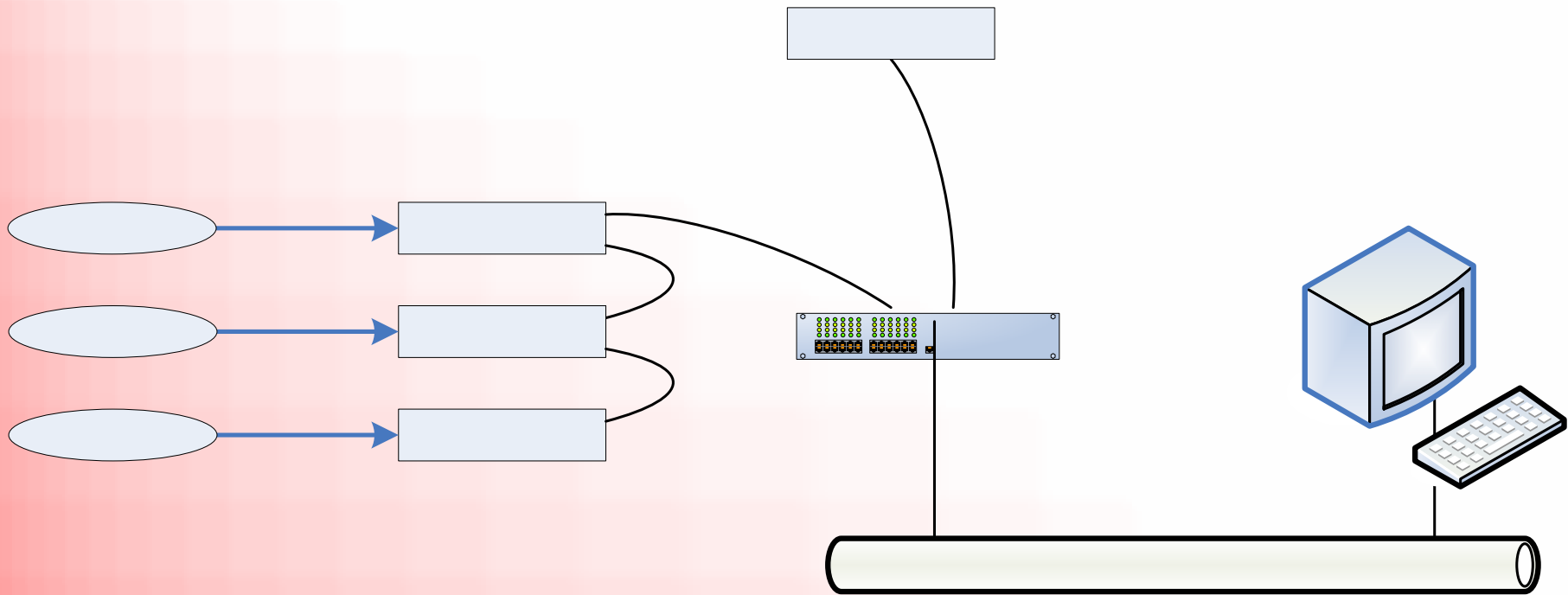
Function Generator and Timing Made of Commercial off-the-shelf Parts



LOCO: Connect up to 10 Pumps on one HV PS and Measure Pressure in Each



BLM: Integrate Bergoz Beam Loss Monitors and Provide Them with Electric Power



microIOC Web Server

microIOC - Mozilla

file:///D:/mark/CSL/microIOC/brochures/luoc-webctl/index.html

microIOC

Web Control Interface

Page Creation Time: 2005-10-02 17:55:33 (local time)
 Host Name: csl14.cosylab.com

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[microIOC] | [[EPICS](#)]

General

Up-time:	0d 2h 49m 23s
Load average (1 minute):	5%
Load average (5 minutes):	17%
Load average (15 minutes):	25%

Storage

Device	RAM
Mount Point	N/A
Total (kB)	1,035,320
Used (kB)	997,624
Free (kB)	37,696
Used (%)	96%

Network

Device	eth1	lo	vmnet8
Link Type:	Ethernet	Local Loopback	Ethernet
Auto Start on Boot:	no	no	no
Configuration:			
Internet (IP) Address:	192.168.74.130	127.0.0.1	192.168.173.1
Broadcast:	192.168.74.255		192.168.173.255
Network Mask:	255.255.255.128	255.0.0.0	255.255.255.0
Hardware (MAC) Address:	00:0E:35:B3:8C:91		00:50:56:C0:00:08
Packets Received:	6,216	551	0
Bytes Received:	42,285,017	25,860	0
Packets Transmitted:	7,163	551	96
Bytes Transmitted:	4,347,864	25,860	0

Developing Environment

- `export UIOC_SDK_ROOT=/var/uioc/epics-2.0.1-sdk`
- `$ uioc-sdk`
- `uioc:epics$ export UIOC_TARGET=10.0.0.35`
- `uioc:epics$ uioc-update`
- `uioc:epics$ cd example`
- `uioc:example$ make`
- `uioc:example$ uioc-deploy`

Nice Features

- Dual microIOC box
- redundant IOC
 - more CPU power
 - compact



Local console and keyboard

No fans, no disk, no moving parts, boot from flash



The Main User Features Are:

- completely stand-alone, no VME/PCI or boot PC necessary
- plug&play: configure IP (DHCP), connect cables and it works
- simple configuration through Web server, built-in EPICS db
 - VDCT preconfigured db file for standard devices: PLCs, vacuum, timing, motor control and monochromators
 - a simple wizard to configure record names and constants
- installed EDM, Java and Web-based panels for display and setting

Possible Applications



- Diskless booting – reduce boot-up time
- Massively distributed systems (array of telescopes)
- Integrate a few signals here and there (utilities)
- Integrate PLCs into EPICS
- Protocol converter: eg. Modbus - EPICS
- isolate device Ethernet network from other IOCs
- Allows equipment vendors to integrate EPICS
- Network sniffer/debugger, specially for CA
- Office desktop EPICS development/test system
- EPICS course hardware
- Replacement contracts
 - 24h replacement shipping

CONCLUSIONS: What's new about this?

- In principle, nothing
- The real value of the microIOC is in its simplicity and user-friendliness without compromising robustness.
 - because there are many people, who don't have the time to bother how to install and use it in detail.

- **www.microIOC.com**



Implementation Details

- dual Ethernet port allows to separate microIOCs and devices from the rest of the control system
- available with Linux and RTEMS operating systems and on request with vxWorks
- database can be persisted in flash, avoiding problems due to network failures
- hardware components of the microIOC are of high quality and have long life times
 - PS has 500,000 h MTBF (55 years)
- by design, mechanical parts such as hard disks and fans are avoided

Fanless Processors for Everybody

Winstone 99 Performance

Processor	Performance (Relative)
National Geode GX1	Lowest
Transmeta 5600	Medium-Low
VIA Eden VE 1400	Medium-High
VIA Eden VE 1500	Highest

Tested on Winstone 99 instead of Winstone 2001 due to speed limitations of NS GX1

* VIA Eden 1400/1500 Platform: On Chip 2D/3D AGP VGA, 8MB Shared Memory, 1024x768x16 bit resolution; 128MB PC133 SDRAM; 13.5GB UDMA66 HDD; Windows 98 SE.

** Transmeta benchmarks tested on Sony Vaio Picture Book

*** NS Geode GX1 Cyrix Media GX MMX-S 233MHz 64MB*1 PC-133 SDRAM CS5530A-UCE ,Award pos561/pos563 BIOS v1.10 HDD: Quantum 40GB AT Fireball+AS Windows 98 SE.

VIA Confidential and Proprietary

start | 16 of 24 | 11x8.5 in | Re: NJNO: odotter... | Total Commander 6.0... | miv-bi.com - news - ... | Compose: (no subject) | Adobe Acrobat CE - [...] | Corel PHOTO-PAINT 9 | 19:59 | mreda | 21.7.2004