C Data Solutions

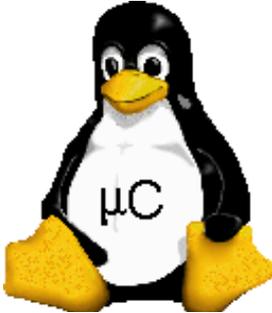# CoCo

Embedded Compact Computer

Http://www.cdatas.com/   Email: info@cdatas.com   Actual size 43* 37*5 mm

**32 bit 500MHz Blackfin CPU
32 MB SDRAM
8 MB FLASH
RTC**

**Royalty free ucLinux OS
Free tools**

**FPGA expansion bus
LCD/Parallel I/O
JTAG port
SPORT
RS-232
SPI**

**Compact Flash Type II Card
Plug into any CompactFlash
Socket**

Compact Computer (CoCo bean) provides a flexible solution to the design problems presented by the numerous differing applications of embedded computers
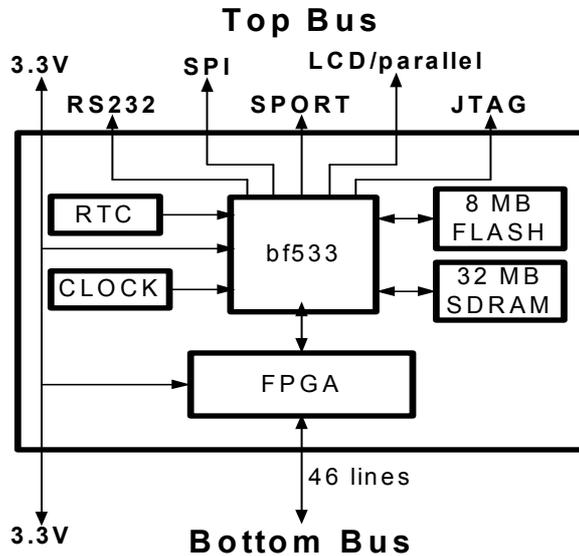
Computer Flash Computer is designed to give application engineers a common base on which to build systems to satisfy multiple system requirements. The Compact Computer does this by providing

- A miniature computing platform in a standard form factor
- A structure enabling commercially available Compact Flash cards for expansion and flexibility.
- FPGA provides CompactFlash interface, user defined interface, hardware acceleration or system glue logic.

The Compact Computer utilizes Analog Devices BF533 processor. The on-board flash memory file system provides storage for the operating system (uClinux) and user applications. Expansion is via a FPGA bus interface which can be 8/16 bit bus compatible with Compact Flash devices and systems with CompactFlash sockets.

The Compact Computer reduces software development costs by providing standard interface (uClinux). Access to JTAG signals for debugging allows the use of GNU tools and graphical debuggers. All tools and the operating system are free.

Compact Computer Block Diagram (Type II Compact Flash Card)

Top Bus

RS232   SPI   SPORT   LCD/parallel   JTAG   3.3V

- RTC
- CLOCK
- bf533
- 8 MB FLASH
- 32 MB SDRAM
- FPGA

46 lines

Bottom Bus

3.3V

Top Bus
- 50 pin connector
- Vcc and Gnd
- RS-232
- SPI
- SPORT
- LCD/Parallel

Bottom Bus
- 50 pin connector
- Vcc and Gnd
- All signals connected to FPGA programmed as CF Host 8/16 bits programmed as CF Device 8/16 bits
- User defined 'any bus'

Compact Computer Specifications

CPU
- Analog Devices BF533 @ 500 MH 600 MHz parts available, 750 MHz planned

IO
- RS-232
- SPI
- SPORT
- LCD/parallel
- JTAG

Expansion
- FPGA 46 signals
- CF device, CF host, 'any bus'

Memory
- 32M Byte SDRAM (64M footprint)
- 8M FLASH FLASH (16M footprint)

Integrated OS
- Boot loader (u-boot) for support of third party RTOS.
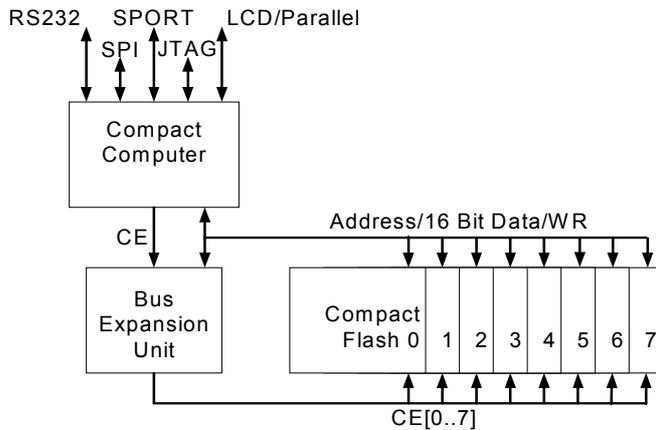- ucLinux 2.6 OS

Integrated Development Tools
- Free GNU C/C++ cross development.
- Insight debugger

Power Requirements
- 3.3V regulated DC @ 200 mA

System Diagram 16 bit Host

RS232   SPORT   LCD/Parallel
SPI   JTAG

Compact
Computer

CE

Bus
Expansion
Unit

Address/16 Bit Data/WR

Compact
Flash 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7

CE[0..7]

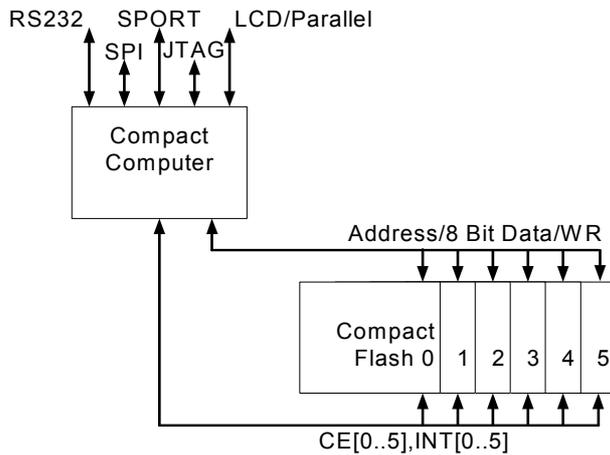Compact Computer 16 bit bus
- Generates CE signal

Bus Expansion Unit
- De-multiplexes CE to selected CF slot
- Multiplexes interrupts to CFC

Requires external hardware
- Address/Data bus provides communications between CFC and

System Diagram 8 bit Host

RS232   SPORT   LCD/Parallel
SPI   JTAG

Compact
Computer

Address/8 Bit Data/WR

Compact
Flash 0 | 1 | 2 | 3 | 4 | 5

CE[0..5],INT[0..5]

Compact Computer 8 bit bus
- High byte data bus used for CE [0..3], INT[0..3] signals. Additional CE/INT from redundant CF signals
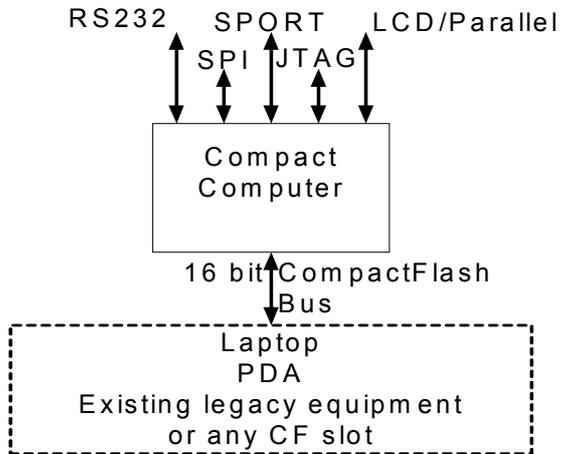
No external hardware

Host Applications

- Industrial control/monitoring
- Wearable/handheld/portable devices
- Autonomous vehicles
- Rapid product development

3rd Party CF Cards

- RS232/422/485
- ADC/DAC/DIO
- GSM/GPRS
- GPS
- Bluetooth
- Wireless 802.11b
- Zigbee
- Ethernet
- USB
- Camera/CAM
- Disc/Storage

System Diagram 16 bit CF device

RS232   SPORT   LCD/Parallel

SPI   JTAG

```
Compact
Computer
```

16 bit CompactFlash Bus

```
Laptop
PDA
Existing legacy equipment
or any CF slot
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Compact Flash Computer

- Compact Computer plugs into |CompactFlash slot on any device
- FPGA programmed as 16 bit CF interface to emulate UART
- FPGA can be programmed to emulate any CF device

Device Applications
FPGA COM port

- Accelerator for legacy equipment
- Secure applications
- Digital I/O
- FPGA hardware acceleration

Device Applications
FPGA mimics storage

- Mimic storage card. Data can be accessed via RS232/SPI while files are being written. Use GSM to export data.

System Diagram 16 bit CF device

RS232   SPORT   LCD/Parallel

SPI   JTAG

```
Compact
Computer
```

46 bit Digital I/O

```
system logic
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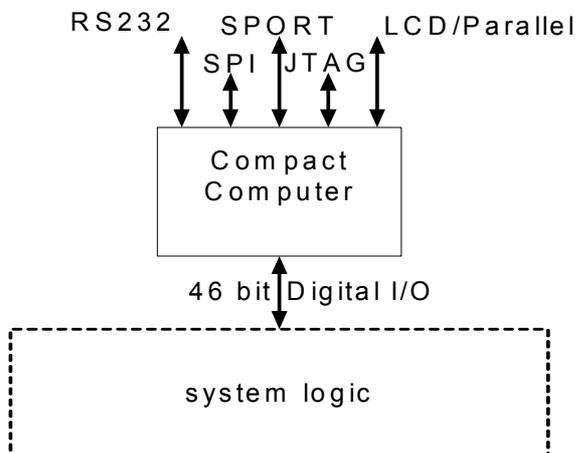
Processor Module

- Compact Computer plugs into low cost carrier board
- FPGA programmed to reduce system hardware

Device Applications
Processor module

- Miniature embedded devices
- Volume production

C Data
Solutions

Email: info@cdatas.com
Http://www.cdatas.com/