MICROPROCESS, manufacturer
of Eurocard industrial computers,
innovates with
EUROPACT

USB

Compact PCI

calculateur standard

CompactPCI

CPU BORDS

Pentium

PowerPC

Low power
Real Time

SYSTEM I/O's

Graphic
Internet
USB

RS232/485
IEEE1394

3U

4U

Bus
Contact
Panel

Redundant Power
supplies

Cables

Starter
Kit

USB

INDUSTRIAL I/O's

Plug and Play

For the Real time

Hot Swap

Mobile applications

Remote I/O's

Deterministe

1 ms

CompactPCI System

32bit CPU for embedded and real time

PCI SE CPU 20

Low Power PC
Intel embedded Pentium processor
5,5W @ 166 MHz - 5,6 SPECint95
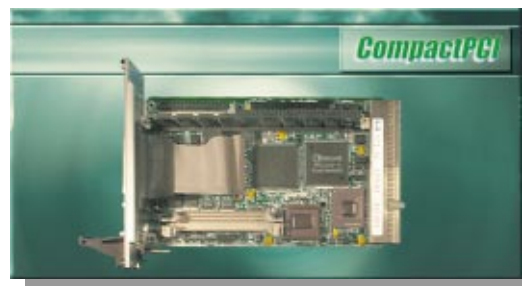**Diskless Boot**
(DiskOnChip up to 144MB)

Windows 2000 Professional   RTX   LINUX

PCI SE CPU 03 / 74

Critical Real Time and Embedded
PowerPC 603e or 740
3,7W @ 400 MHz - 16,0 SPECint95
8 MB Flash (64bit Access)
PC/104 Interface

SoftKernel   LINUX

Processor	
MMX 166/66 MHz (EMBMOD166)	PowerPC 603e up to 300MHz PowerPC 740 up to 400MHz

Memory	
Cache ... 512 KB DRAM ... 64 MB (DIMM 168) Flash BIOS	Cache ... 512 KB DRAM ... 64 MB (DIMM 168) Flash boot 1 MB Flash ... 8 MB

System Ports	
2 RS232, RS422 or RS485 1 Par. Port, Keyboard, Mouse 2 Master USB ports IRDA, Speaker	2 RS232, RS422 or RS485 1 Par. Port, Keyboard, Mouse IRDA, Speaker PC/104 Mezzanine receiver

Storage	
Fast IDE Port for 2 HD Floppy Port for 2 FD DiskOnChip (12 à 144 MB)	Fast IDE for 2 HD Floppy Port for 2 FD

Miscellaneous	
Battery Powered RTC (NiMH) Watchdog / Timers / Counters APC Power management	Battery Powered RTC + NVRAM (NiMH) Watchdog / Timers / Counters APC Power management

CPCI Bus	
System, 32bits @ 33MHz, rev 2.1, V(I/O) 5V 430HX Chipset 8TE Width	System, 32bit @ 33 MHz rev 2.1, V(IO) 5V MPC106 Chipset 8TE Width

Boards

system

PCI SE CPU 23

**Single Board
Computer,orMultiprocessing
PowerPC 823
VGA/LCD, Ethernet, USB, 2RS,
SCSI, 2 PC-MIP Mezzanines
I2O Compatible**

Processor

PowerPC 823e   @ 66 MHz

Memory

SDRAM PCI/Video shared …256 MB
Flash Boot 0.5 or 2 MB
Flash …8 MB

System Ports

2 RS232 or RS422
10BaseT / AUI Ethernet
Master/Slave USB (12Mbs)
2 PC-MIP (type 1) Sockets
PC-MIP type II on req. (I/O's on
daughter board)
L1 Signals for T1 type link

Video Controller

VGA (analog) or LCD on daughter board

Storage

Ultra 2 SCSI

Miscellaneous

Battery Powered RTC (NiMH)
EEPROM

CPCI Bus

System and Peripheral
32bit @ 33 MHz
rev 2.1, 3V or 5V
PCI / PCI 21152 and V360EPC Bridges
4TE Width

THE EMBEDDED WITH WINDOWS CE
◆ Applications can start without disk, little memory, be win32 API beneficial and can extensively use the USB and all the CPU23 functionalities (LCD/CRT, TCP/IP, SCSI...)

THE REAL TIME WITH WINDOWS
◆ The VenturCom RTX is the real time extension for the Microsoft NT, 2000, NTE and CE, offering very short response times.
◆ RTX is fully integrated to Windows kernels and is served by all the development environments, such as Visual C++..., accesses all the win32 API's, supports the multiprocessing, provides a real time TCP/IP stack and the DCX services (real time DCOM/OPC)

THE REAL TIME WITH LINUX
◆ RT Linux makes two services co-resident:
⇒ POSIX 1003.1 standard services (multithread aspects standardization with a set of C system calls): GUI, TCP/IP, NFS, Web-servers, etc.
⇒ Real time services for applications requiring a short response determinism.
These two services may communicate via shared memory or non-blocking FIFO's.
◆ The base idea was to rewrite the Linux code in charge of interrupts to ensure full priority to the real time processes. When a non real time application must handle an interrupt, it is converted into a software interrupt, and transmitted only if no real time task is to serve.
◆ Microprocess offers either a standard Linux distribution or an embedded/real time version.

THE CRITICAL REAL TIME WITH SOFTKERNEL
◆ SoftKernel is the first full object real time executive, already fully operational for several years.
◆ Benefits :
⇒ Hardware independent (ensures to capitalize on software developments)
⇒ Customizable to specific needs without modifying the source code (using the object classes inheritance and derivation)
⇒ High real time performances and a better size/services trade-off than with traditional architectures
⇒ Dynamically down-loadable applications without interrupting their operation
⇒ Team development and version releases without recompiling the unchanged code
⇒ Usage eased by fully object, re-entrant, always pre-emptible and deterministic interfaces (network, GUI, Web server, MPEG extensions, etc.)

Disks

PCI SF PHD

◆ Rack unit including one hard disk and one floppy drive (factory mounted to the right of CPU20, CPU03 or CPU74)

Peripheral CompactPCI

Intelligent I/O's

PCI SE CPU 23

PowerPC 823
2 PC-MIP Mezzanines, type I or II
VGA(CRT/LCD), SCSI,
Ethernet, USB, 2RS,
I2O Compatible

The CPU 23 board is indifferently located in a System or Peripheral slot (see previous page). When used as an intelligent peripheral, the CPU 23 liberates the system controller from real time constraints, and tasks such as:

- IO management, supported by two PC-MIP mezzanine boards (I/O's connected to the rear J2 or, on request, on the front),
- Temporary storage (on hard disk or FLASH) for delayed transmission,
- Secondary display or customized GUI handling.

The CPU 23 offers several communication links:
- The CompactPCI Bus,
- The USB bus (host or slave),
- Ethernet, 10BT or AUI, or synchronous link, even L1 signals for T1 link,
- Two full duplex asynchronous RS232 or RS422 links.

GUI - Communications

PCI SE IOS 00

10 - 100 MB Ethernet
SVGA (CRT - LCD)
USB

ETHERNET
10 - 100 Mb (auto section) 100 Base Tx or 10 Base T /AUI

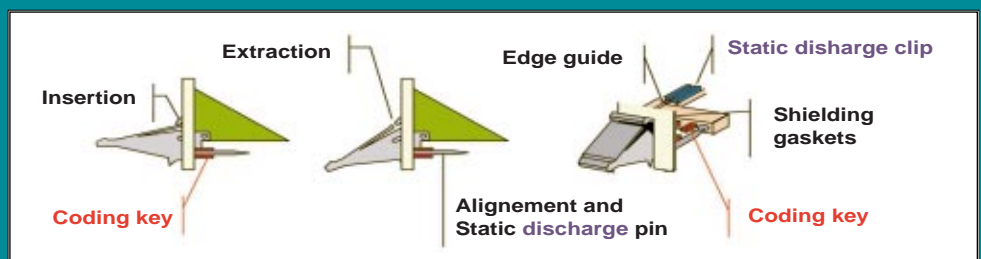| MULTIMEDIA |
|---|
| 64bit Graphic accelerator (65555 chip) 135 MHz RAMDAC, 4 MB, multimedia port (ZV port) CRT and LCD, up to 1280x1024 |

USB Bus
Two 12 Mbps ports

CPCI Bus
Peripheral, 32bit @ 33 MHz, Rev 2.1, 3V or 5V V(IO), 4TE width

MECHANICAL STANDART

Every EUROpact board (CPCI boards and USB boards) complies with the CPCI IEEE 1101.x standard. This standard provides a high EMI/RFI noise immunity and an effective protection against static. The boards, to the Eurocard form factor, are maintained on the four edges by the rear backplane connector, two edge guides and the front panel, thus offering a better mechanical strength against vibrations and shocks than with ISA, PCI… boards.

For safety, all EUROPACT boards may be fitted with a mechanical keying to prevent inserting a board into the wrong slot. To permit it, all our racks are delivered with the appropriate keying prongs.

Extraction — Insertion — Coding key — Edge guide — Alignement and Static discharge pin — Static disharge clip — Shielding gaskets — Coding key

Boards

IEEE 1394 - FireWire

PCI SE I3E 00

**A very fast 400 Mbps bus
Real time Synchronization
Easy to use and to implement PnP**

Functions

Three IEEE 1394 ports for high speed interconnection of up to 64 computers. Automatic transmission - reception with DMA, burst mode on 400 Mbps PCI

Characteristics

Transaction: Asynchronous or isochro--nous with programmable duty cycle and internal/external/software sync.
Topology: point-to-point, daisy chained or hierarchical, up to 64 connections.
Real time libraries provided with the board:
System to system real time synchro--nisation and Input/Output functions.
OS: Windows, but also SoftKernel, Sun Solaris 2.6, etc.

Connections

Three front panel ports

CPCI Bus

32bit @ 33 MHz
rev 2.0, 5V(IO), 4TE width.

Parallel and Serial Links

PCI SE IOS 08

**12 Mbps very fast serial links
asynchronous and Isolated
8 RS232/422/485
Or
4 RS232/485 and 1 parallel ports**

Functions

8 RS232/485 or 4 232/485 and 1 // port
1 IrDA port

Characteristics

RS232 up to 115.2 kbps, with CTS/RTS and/or DSR/DTR
RS422/485 up to 12 Mbps
Software compatible with the 16C55x
FIFO for Tx and Rx : 128 bytes, with flow control.
FIFO wrong data detection
Programmable character detection
Parallel port : IEEE 1284 EPP
ESD protection to 15kV (IEC100-4-2)

Connections

Serial : 1 High Density to 8 DB9
Parallel : 1 HE10-26   (DB25 optional)
IrDA: 1 optional port

CPCI Bus

32bit @ 33 MHz
rev 2.1, 5V(IO), 4TE width.

CE REGULATIONS

Our boards and racks are delivered with all standard accessories for shielding and grounding (clips and discharge pin, shielding gaskets, etc.).
Blank front panels are also available on request for empty slots.
The EUROpact system complies with the mains 93/68/CEE and 73/23/CEE requirements for electrical devices powered within defined voltage limits.

SYSTEM INTEGRATION
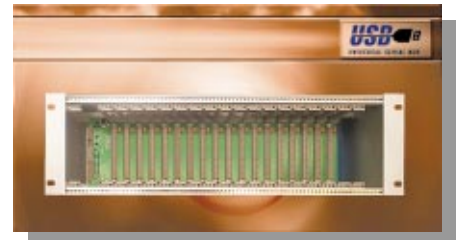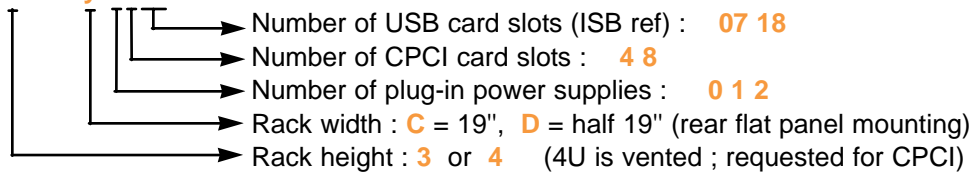
CompactPCI or USB Card Cages

EPA 4U RAC 2400

EPA 4U RAC 1807

EPA 3U RAC 1018

♦ Reference : EPA xU RAy abcd

→ Number of USB card slots (ISB ref) :   07 18
→ Number of CPCI card slots :   4 8
→ Number of plug-in power supplies :   0 1 2
→ Rack width : C = 19", D = half 19" (rear flat panel mounting)
→ Rack height : 3 or 4   (4U is vented ; requested for CPCI)

(Please check with your sales contact for the availability of the various options)

♦ Interconnections : The USB board I/O's are accessed from the rear panel with DIN41612-96 connectors.
These DIN connectors accept :
⇒ 64 lines flat ribbon cables for link to external contact **panels, signal conditioners, insulation** devices.
⇒ Soldered cables and connector caps, **with possible locking on the backplane**
The removable rear cover can be machined to get cables through or mount connectors.
♦ Racks are delivered with the necessary keying elements, for slot dedication
♦ In order to ease the system integration, Microprocess also offers
⇒ Blank **front panels to close empty slots.**
⇒ **Front cable holders, to route and firmly tie front cables to the rear of the rack** .This provides a neat cable arrangement, and reduces the risk of unplugging or bad contact.

EFFECTIVE

USB Card Holder

EPA SE SUP

♦ The USB cards (ISB ref) can be individually installed close to sensors or actuators (located in an other rack or directly on the machine).
♦ EPA SE SUP 00 : CEM tight casing, rear mounting.
♦ I/O's accessed with DIN41612-96 connector
♦ EPA SE SUP 01 / 02 : 64 pins Contact panel holder, mounted on flat surface / DIN rail.

I/O Contact panel

EPA XE BOR 64 XX

♦ The contact panels ease the rack wiring by making available on screw contacts the 64 USB board I/O signals (DIN1612-96 connector a and c rows).
♦ Each contact panel is delivered with a **XX** decimeter flat cable, to be specified on order.
♦ DIN rail, or other, mounting option on request.

SYSTEM INTEGRATION

CompactPCI Bus

PCI SE BPL 04 02

♦ PCI SE BPL 0**a** 0**b**

           Nbr of PSU slots   **1 2**
           Nbr of CPCI slots   **4 8**

♦ Rev 2.1 32bit @ 33MHz compliant.
♦ The system slot is located on the right.
♦ $V_{(I/O)}$ 3,3V or 5V.
♦ 1 or 2 Hot Swap and Redundant plugin power supplies.

CPCI / USB Power supplies

EPA SF PWR

♦ EPA SF PWR 00 00 : CompactPCI 150W Redundant Hot-Swap Power supplies, 8TE width
    +5V @ 20A, +12V @ 2A,-12V @ 1A, +3.3V @ 3A
♦ EPA SF PWR 01 00 : USB Power supply, 8TE width

USB Bus

ISB SE BPL 07 00

♦ ISB SE BPL **ab** 0**c**

           Nbr of PSU slots   **0 1**
           Nbr of USB slots   **07 18**

♦ Includes a 7 ports Hub, rev 1.x compatible
♦ Connector for one separate rack-mounted 5V power supply.
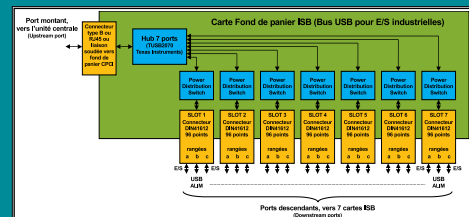
THE USB BACKPLANE DETAILS

The USB backplane incorporate a Hub function for distributing the USB to the USB boards.
♦ *Beyond of its function, it manages the individual power distribution and stabilizes the voltage for each slot.*
   A faulty USB board cannot affect the others nor the power supply.
   Reciprocally, it is protected against a short circuit.
♦ *No front cable, the wiring is easier.*
   The USB board fully gets benefit of the USB advantages.
♦ *Plug-&-Play : No jumper, no conflict.*
♦ *Hot-Swap : No wrong handling, no failure on power-on.*
♦ *Ease of use by program and full hardware and manufacturer independence.*
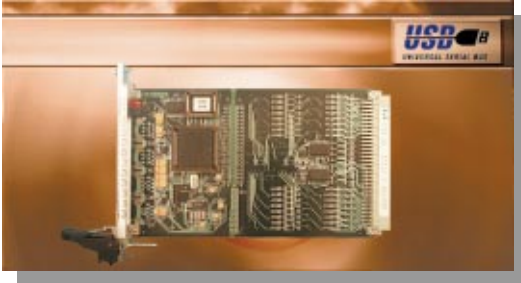
USB Cables

EPA SF PWR

♦ CAB **aa** USB **bb bb**

           Length in cm
           End connectors
           AA : A/A type, **BB** : B/B type
           RR : RJ45 / RJ45 type

USB

Digital Isolated Inputs

ISB SE IDI 32

Digital Inputs

On DIN1612 (a+c rows)
- 32 inputs, isolated
  (adjacent isolation : >1500V)

Auxiliary Inputs/Outputs

On DIN1612 (row b)
- DC-DC 5V converter (20mA @ 4V)
  For input polarization
  (suppresses an external power supply)
- 4 inputs and 4 outputs, 5v, isolated, with common return, 5V powered by the converter

Sorties TOR isolées

ISB SE IDO 32

Digital Outputs

On DIN1612 (a+c rows)
- 32 outputs, isolated
  (adjacent isolation : >1500V)
- Switching : 1A @ 48V max
  (MOS transistor equ. to a relay)

Auxiliary Inputs/Outputs

On DIN1612 (row b)
- DC-DC 5V converter (20mA @ 4V)
  For output polarization
- 4 inputs and 4 outputs, 5v, isolated, with common return, 5V powered by the converter

Isolated Digital I/O's

ISB SE IDM 32

Digital Inputs/Outputs

On DIN1612 (a+c rows)
- 16 inputs, isolated
  (as for IDI 32)
- 16 inputs, isolated
  (as for IDO 32)

Auxiliary Inputs/Outputs

On DIN1612 (row b)
- DC-DC 5V converter (20mA @ 4V)
  As for IDI 32 and IDO32
- 4 inputs and 4 outputs, 5v, isolated, with common return, 5V powered by the converter
  Digital Isolated Outputs.

Parallel Digital I/O's

ISB SE IOT 32

Digital Inputs/Outputs

On DIN1612 (a+c rows)
- 32 digital I/O lines arranged as
  4 8I/O ports, each input or output
  configurable:
    2 program configurable
    2 jumper configurable
- Switching : 5V CMOS logic, can drive LED's

Auxiliary Inputs/Outputs

On DIN1612 (row b)
- 4 inputs and 4 outputs, 5v (CMOS logic)

BOARDS

Analog Inputs

ISB SE FAI 16

Analog Inputs

On DIN1612 (a+c rows)

♦ 16 common mode inputs, or 8 differential 12 bits resolution, +/- 10V max range

♦ Sequential or programmed channel scan, with gain programmable differential amplifiers

Auxiliary Inputs/Outputs

On DIN1612 (row b)
♦ 5V DC-DC converter to supply the analog section, with output available.
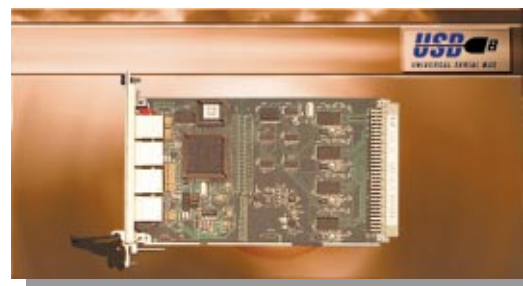
Analog Outputs

ISB SE IAO 08

Analog Outputs

On DIN1612 (a+c rows)
♦ 8 isolated voltage or current Outputs
♦ adjacent channel isolation
♦ 12 bits resolution
Range +/- 10V max 0 or 4-20ma

ISB SE HAI 16

Analog Inputs

On DIN1612 (a+c rows)

♦ 16 differential inputs, with variable resolution and frequency (up to 24bit resolution, or several hundred sample/sec, with lower resolution.
Range +/- 10V max.
♦ 4 A-to-D converters operate in parallel, with programmable gain and notch filter differential amplifiers for each channel, with automatic calibration

Auxiliary Inputs/Outputs

On DIN1612 (row b)
♦ 5V DC-DC converter to supply the analog section, with output available

Hybrid Inputs/Outputs

ISB SE IMM 00

Analog and digital inputs/Outputs

On DIN1612 (a+c rows)
♦ 16 common mode inputs, or 8 differential, with 12 bits resolution, +/- 10V max range Commande : ± 10V max
♦ 8 outputs, +/- 10V max range, 12bit voltage resolution
♦ 8 digital bi-directional 5V lines

THE USB BENEFITS

♦ *The Hot-Swap and the automatic configuration simplicity*
♦ *No proprietary interface and OS version independent*
♦ *No protocol to develop*
♦ *Determinism to the millisecond*
♦ *I/O remote installation (up to 25 m) :*
  ⇒ *Eases the wiring*
  ⇒ *Increased performances by moving the low level*
♦ *critical tasks to the I/O's*

A CUSTOM INDUSTRIAL BOARD ?
IT'S EASY !

Freely download our Industrial Serial Bus (ISB) specifications and the USB common section diagrams from
http://www.microprocess.com/europact
The ISB standard warranties good operations for any manufactur.

Cartes

I/O Coprocessor

ISB SE CPU 23

An intelligent USB peripheral…

The CPU 23 board, linked to a Host via USB, can control :

- Local I/O's on PC-MIP mezzanines
- Remote systems through serial RS lines
- And use Ethernet 10BT to manage remote sub-systems.

A sub-system connected by Ethernet…

The CPU 23, linked by Ethernet, ATM,… can control :

- Local I/O's on PC-MIP mezzanines
- Remote systems through USB or RS lines
  It can also drive a display and act as a concentrator.

Processor

PowerPC 823e à 66MHz

Memory

SDRAM ... 256 MB
Flash boot 0,5 ou 2MB
Flash ... 8 MB

System Ports

2 RS232 or RS422, 1 // port
Ethernet 10BaseT / AUI
Keyboard, mouse, VGA (CRT/LCD)
Master/Slave USB
2 PC-MIP type I or II mezzanines

Miscellaneous

Ultra 2 SCSI (LVD)
Battery Powered RTC (NiMH)
Daughter board sockets

Any computer type fitted with an USB bus, under Windows or Linux, can control USB boards:

- **Clustered in a rack, or**
- **On individual holders**

Shaft Control

VERY PERFORMANT

ISB SE AXE 00

Description

- **4 shafts** controlled by a specific DSP, with 100 s loop time per shaft, managed by a processor handling also the USB transactions.
- 4 speed profiles : **Trapezoid, S, speed and electronic gear** (the slave shaft setting is the product of the position reading of the master shaft by a coefficient. The master shaft can be driven either externally or by the board).
- **CNC or contournage**
- **Shafts and shaft boards Synchronization**
- **Over 120 base and macro functions available.** Processes performed either interactively (by commands from the keyboard) or downloaded for execution by the supervisor and the shaft DSP.
- Automatic zero seek (home)
- Each shaft can generate two types of output :

  ⇒ **Analog speed control** (16bit) for use by a DC or AC motor speed controller.
  ⇒ **Digital PWM control**, 3 phases (A, B, C, sign), with two modes : 1/1 PWM or sign/amplitude PWM.

- **Isolated I/O's,** per shaft : A, B, **Index and Home** (filtered coder signals) and **2 travel limit sensors.**
- I/O : **4 digital inputs**, **4 digital outputs**, isolated, **and 4 analog 0-5V inputs.**
- Each shaft can individually be driven by 4 profiles, open or close loop.
- A position can be time specified (**cubic spline profile for CNC or contour).**
- **A profile may be modified during a displacement,** as for the trapezoid with dissymetric parameters for gravity compensation.
- Each shaft owns 2 fully programmable **breakpoint** functions. One breakpoint becomes active on a condition or an event appearing on a shaft. They allow to automatically perform the following actions : Hard stop, Soft stop, shaft parameters reprogramming.

USB

STARTER KIT

ISB KIT DEM 00

The starter kit includes all elements for the USB bus evaluation.

It is required for designing applications based on USB boards or following the ISB specifications.
The kit includes the following items :

♦ One ISB SE IOT 32 board
♦ One USB cable for connecting the board on a computer (standard 'A' connector).
♦ One CDROM including all user's manuals and Microprocess' USB boards software modules. The CDROM is updated according to the release of new boards and software.
♦· Various documentation .
  You only need a PC supporting USB 1.x and a development environment for you application.

USING USB BASED BOARDS

Our ISB boards are delivered with a PROM loaded according to the board type (IDI 32, IDO 32,..). This memory handles both the board I/O's and the USB communication protocol with the host.
This PROM'ed software is host OS independent.
On the host side, the OS and the hardware take charge of the higher and lower USB protocol layers.
Purchasing the starter kit will complete the host OS.
The user has no protocol to develop. He so can concentrate on his application software and access the ISB units with standard I/O functions.
With Windows (98 and 2000), the main API32 functions to be used for the ISB boards are:
CreateFile, WriteFile, ReadFile, CloseHandle

Note: As agreed with Microsoft, Microprocess delivers Windows2000 to his industrial customers since July 1999.

SOFTWARES ADAPTATION

Sofwares delivered as part of the starter kit can be easily adapted or rewritten for a special application.
For instance:
♦ *You wish to preprocess every data exchanged with an I/O board before returnig it to the application.*
♦ *You wish to program functions adapted to your needs diractly on the USB I/O boards.*
How to acheive it ?
♦ *On the Windows based side, you must purchase the Visual Studio tools along with the Microsoft SDK, and possibly the DDK.*
♦ *On the peripheral side, you use a PC based compiler for 8x930 Intel microcontroller (it's a core 251 with an USB interface). You may take inspiration from the Intel and Keil sites*

http://www.intel.com/design/usb/
Http://www.keil.com/home.htm

USB FREES APPLICATION SOTWARES FROM COMMUNICATION TASKS

Any communication requested by an application software on an I/O USB board is preset by the operating system when declaring the communication mode. A good part of the bus bandwidth may be allocated to each transfer.
Three communication modes can be used, as seen below : Isochronous, Interrupt and Bulk.
All effective tranfers are are automatically driven by a component, the "Host Controller". This controller totally unloads the I/O tasks from the CPU.
Because of the USB and the host controller standards (only handled by the OS), the application softwares use high level standardized services.
So to the application developpers' benefit, developped softwares can be ported, as being hardware independant, OS independant and even I/O board independant. Developpers, specifically have no more interrupts to manipulate inside a driver (in Windows kernel mode).

EVERYTHING IS SIMPLER AND FASTER

The future USB enhancements will strongly increase the real time speed and performances, still offering a FULL COMPATIBILTY WITH EXISTING EQUIPMENTS

	Isochronous	Interrupt	Control	Bulk
Access type	periodical	periodical	bus management	non periodic
Bytes exchange	1 ms	1 to 250 ms	system	request
Max bytes number	1023	64	64	64
Garrantied BW	≤ 90%	≤ 90%	≥ 10%	no demand
Error detection	yes	yes	yes	yes
Error connection	no	yes	yes	yes

Microprocess Formation

Formations pratiques en Informatique Industrielle

Pour connaitre la liste complète de nos stages, la durée, le prix, les disponibilités ou pour un stage "intra-Entreprise" contactez nous au **01 47 68 80 80** ou visitez notre web **http://www.microprocess.com/formation**
Organisme de formation déclaré auprès de la délégation à la formation continue sous le n°11 92 05608 92

MICROPROCESSEURS POWERPC (AGREEES IBM & MOTOROLA)

M7	Architecture PowerPC, le PowerPC 603	**M75**	Mise en oeuvre du PowerPC 603e
M823	Mise en oeuvre du PowerPC 823		

BUS

D9	Le bus CompactPCI	**P8**	Le bus USB
P9	Le bus IEEE1394	**P10**	Le bus I2O

LANGAGES

L3	Le langage Java pour l'informatique industrielle	**L4**	Le langage C++ pour l'industrie et l'embarqué

DEVELOPPEMENTS INDUSTRIELS

D4	Multitâches et Temps réel avec Windows NT 4	**D41**	Drivers pour Windows NT
D6	Applications industrielles avec les MFCs sous Visual C++		
D61	Les technologies COM & DCOM pour l'industrie	**D7**	Le standard OPC de Microsoft

TEMPS REEL

T7	La programmation temps réel et multitâches	**T4**	RTX de VenturCom pour Windows NT/CE
D5	Windows NTE	**D10**	Multitâches et Temps réel avec Windows CE
D11	Portage et Drivers pour Windows CE	**D1**	RT-Linux
T74	Portage d'un noyau Temps réel sur PowerPC	**O5**	Micronoyaux objects embarqués de SoftKernel

MICROPROCESS en quelques mots ...

A FRENCH MANUFACTURER SINCE 1981

With over 50 poeple in the Paris headquarters, a sales force in Paris and Lyon, and an on-going international expansion, Microprocess Ingéniérie manufactures and sells standart products for industrial and embedded applications.
The users are automation, electronic and data processing engineers.
Our board and system design and manufacturing activity allows us to innovate and makes you confident about our expertise as well in software and hardware as in system architecture. Our expertise allows us to offer working solutions and assistance and success warranty.

CUSTIMIZED DESIGN AND MANUFACTURING

Microprocess also designs customized boards up to the pre-production or production level, and ports applications to new operating systems.

OBJECTLIVE, THE MICROPROCESS SOFTWARE DEPARTMENT

ObjectLive is a software editor for the Real Time and Embedded applications. Its SoftKernel Executive merges the Real Time mechanisms and the Object Oriented technics. This company also offers solutions for each software development steps.

THE TRAINING DEPARTMENT

Trainings are performed by engineers who often are involved in our R&D projects. They use theire knowledge for a high level training.

HOT-LINE ASSISTANCE

This department, with direct connections with the R&D department and the manufacturing, listens to you for hardware and software assistance.

For more information please contact us, using our address below, or visit our Web site:

http://www.microprocess.com
mailto:realtime@microprocess.com

Paris : 97 bis rue de Colombes BP87 - 92405 COURBEVOIE Cedex France
☎ +33 1.47.68.80.80   Fax : +33 1.47.88.97.85

Lyon : 20 rue Ravat - 69002 LYON France
☎ +33 4.78.42.87.28   Fax : +33 4.78.38.25.60

microprocess
μP
ingenierie