PowerCore CPCI-680 'Universal Mode' Single Board Computer

The PowerCore CPCI-680 single board computer offers "supercomputer" performance in system- and peripheral-slot operating modes.

- Telecommunications
- Datacommunications
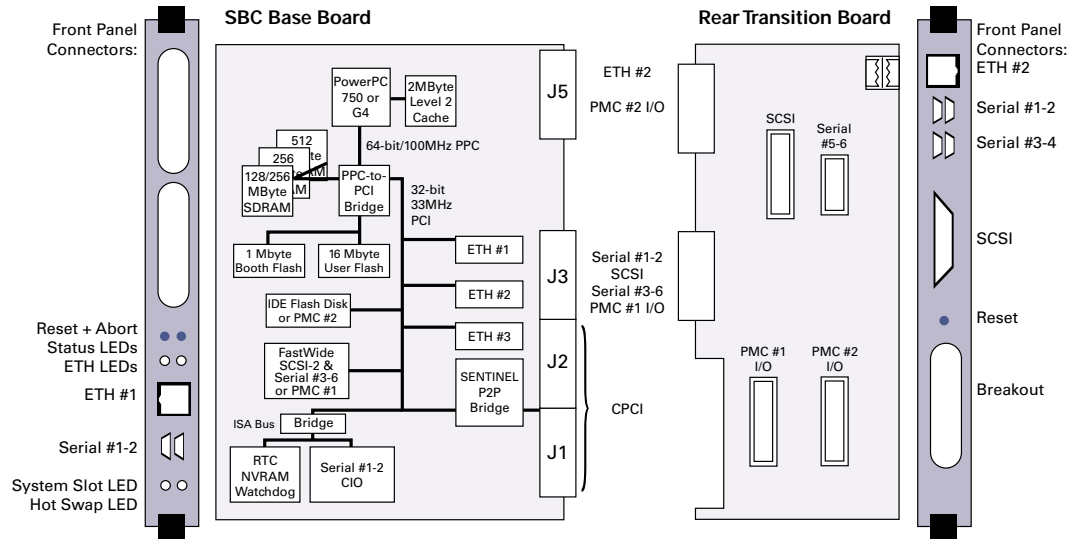- Industrial Control
- Government

Features

- Force's Sentinel "universal-mode" PCI-to-PCI bridge—enables SBCs to switch between system- and peripheral-slot functionality

- PowerPC 750 or PowerPC G4 7400 processor/up to 1GByte high-speed memory for "supercomputing" performance

- Ideal for Linux™ or real-time operating systems (RTOSes)

- Low-power consumption

- Up to three independent Fast Ethernet interfaces

- Fast Wide SCSI-2 interface

- Full Hot Swap support for CompactPCI

- Up to two PMC slots

- Single-slot solution

Highlights

The Force PowerCore™ CPCI-680 CompactPCI® (6U) single board computer brings new levels of flexibility and power to embedded telecommunications, data communications and industrial applications. The first product based on Force's pioneering Sentinel™ "universal" PCI-to-PCI bridge technology, the PowerCore CPCI-680 can function as a high-performance system controller or an intelligent peripheral card, without any need for hardware or software reconfiguration when switching between operating modes. This, combined with its advanced PowerPC™ 750 or PowerPC G4 7400 processor and broad array of interfaces, makes the PowerCore CPCI-680 an ideal choice for configuring fast-to-market, highly reliable multicomputing platforms.

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'Universal-Mode' PowerCore CPCI-680 'Supercomputer' SBC

SBC Base Board

- Front Panel Connectors:
- Reset + Abort Status LEDs ETH LEDs
- ETH #1
- Serial #1-2
- System Slot LED Hot Swap LED

PowerPC 750 or G4 — 2MByte Level 2 Cache

64-bit/100MHz PPC

512
256
128/256 MByte SDRAM — PPC-to-PCI Bridge — 32-bit 33MHz PCI

1 Mbyte Booth Flash — 16 Mbyte User Flash

IDE Flash Disk or PMC #2

FastWide SCSI-2 & Serial #3-6 or PMC #1

ISA Bus — Bridge

RTC NVRAM Watchdog — Serial #1-2 CIO

ETH #1
ETH #2
ETH #3

SENTINEL P2P Bridge

J5
J3
J2
J1

CPCI

Rear Transition Board

ETH #2
PMC #2 I/O

Serial #1-2 SCSI Serial #3-6 PMC #1 I/O

SCSI
Serial #5-6

PMC #1 I/O   PMC #2 I/O

- Front Panel Connectors: ETH #2
- Serial #1-2
- Serial #3-4
- SCSI
- Reset
- Breakout

'Universal-mode' CompactPCI single board computer solution

- Dual functionality: system slot and/or peripheral slot capabilities
- Based on Force Sentinel "universal-mode" PCI-to-PCI bridge technology
- "Zero" hardware or software impact when switching operating modes
- Ready-made building block for multiprocessor systems
- Single-slot solution—even fully configured

High-performance embedded computing platform

- Optimum computing performance in a single 6U CompactPCI slot
- PowerPC 750 or PowerPC G4 7400 processor, at 450/500MHz or 400MHz
- Up to 1GByte SDRAM via memory modules
- Built-in buffers in Sentinel allow fast data transfers across the widely deployed 32-bit CompactPCI bus
- Low-power consumption for embedded applications
- OS flexibility—broad Linux and real-time operating system (RTOS) support

Flexible configurations

- Up to two PMC slots
- Up to three onboard independent Fast Ethernet interfaces
- Two onboard serial interfaces
- Optional interfaces (occupies one PMC slot)
- Fast Wide SCSI-2 interface for mass storage
- Four additional serial interfaces
- Onboard CompactFlash interface for Type II cards

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Enabling power of Force's Sentinel 'universal' PPB

The Force PowerCore CPCI-680 is a powerful and versatile CompactPCI single board computer (SBC) based on Force's revolutionary Sentinel "universal-mode" PCI-to-PCI bridge (PPB). Intelligent Sentinel technology enables the PowerCore CPCI-680 to function as either a system controller (in a CompactPCI system slot) or as an intelligent peripheral card (in a CompactPCI peripheral slot). The Sentinel PPB completely eliminates the need for either hardware or software reconfigurations when the PowerCore CPCI-680 switches operating modes.

By using the Sentinel PPB technology, developers can simplify and accelerate the design of multi-processor systems based on cost-effective, industry-standard components.

Powerful real-time computing—future-proofed and backward compatible

The PowerCore CPCI-680 brings maximum real-time computing performance in a single slot to both system controller and intelligent peripheral modes. The CPCI-680 is built around the PowerPC 750 or PowerPC G4 7400 processor with their ultra-high speed and extremely low-power consumption characteristics. The use of the PowerPC 750 or PowerPC G4 7400, together with up to 1GByte high-speed memory and Sentinel's on-chip buffers for elevated system performance, enables the CPCI-680 to address the most demanding applications. The CPCI-680 is also backward compatible with earlier members of the Force PowerPC-based PowerCore family of SBCs.

Developers can take advantage of the CPCI-680's power and performance when running major real-time operating systems (RTOSes) or when deploying applications based on the low-cost, open-source Linux™ operating system. RTOSes supported by the CPCI-680 include VxWorks® and LynxOS™.

Broad expansion and I/O flexibility in a single slot

In addition to its versatility and high performance, the PowerCore CPCI-680 provides developers with broad expansion capabilities and a wide range of interface options. Up to two PMC slots are available for expansion, and an optional Fast Wide SCSI-2 interface enables high-speed connection to mass storage. There are also up to three independent Fast Ethernet interfaces and two serial interfaces (expandable to a total of six serial interfaces) for maximum I/O flexibility.

The optional onboard socket for Type II CompactFlash cards allows easy and flexible expansion via removable cards that can be either solid-state flash memory cards or disk-based media.

Yet even when fully configured with a complete set of interfaces and its maximum 1GByte memory, the PowerCore CPCI-680 remains a single-slot solution.

'Universal-Mode' PowerCore CPCI-680 'Supercomputer' SBC

Processor/memory

- PowerPC 750 or PowerPC G4 7400 processor, at 450/500MHz or 400MHz

- Up to 256MBytes onboard ECC-protected SDRAM (option to 1GByte via memory module)

- 1 or 2MBytes L2 Cache running at half processor speed

- Up to 16MBytes onboard programmable User Flash

- 1MByte Boot Flash

I/O capabilities

- PICMG 2.16 compatible via rear transition board

- Up to 2 PMC slots with rear-facing I/O

- Optional onboard IDE Flash Disk—via CompactFlash interface for Type II cards

- Optional Fast Wide SCSI-2 via pre-installed SSIO PMC module

- Up to three Fast Ethernet interfaces via 82559

- Two 16C550, RS-232 serial interfaces on front panel (option for four additional interfaces)

CompactPCI interface

- "Universal" PCI-to-PCI bridge—system slot and peripheral slot—32-bit, 33MHz

**Universal
PCI-to-PCI Bridge**

Other features

- MK48T58, 8KByte NVRAM real-time clock

- Z-CIO 8536, 3x16-bit timers, 500ns resolution

- Watchdog timer

- Reset and abort switches, status LEDs, Hot Swap LED

Power requirements

PowerCoreCPCI-680/256-450-L1-16

- +5V 1.7 A, +3.3V 1.8 A

Environmentals

Operating temperature
0ºC to 55ºC with forced air-cooling

Storage temperature
-40ºC to +85ºC

Relative humidity
5% to 95% non-condensing

Board size

Single-slot 6U CompactPCI
160.00mm x 233.35mm

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Force Computers is the leading designer and worldwide supplier of standard and custom systems, board-level platforms and services for the embedded market.

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