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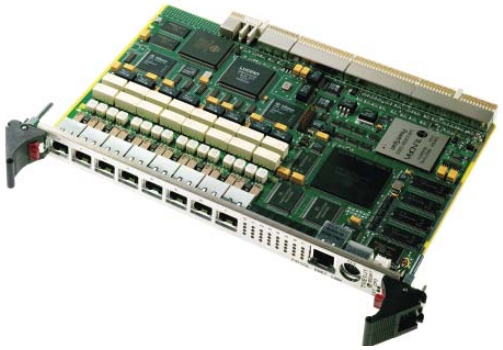
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*i*SPAN® 1635 CompactPCI® T1/E1/J1 Communications Controller

The Industry's Most Advanced CompactPCI Packet Switched Backplane Controller for Next Generation Networks

APPLICATIONS

VPNs
Signaling Gateways
Softswitches
Wireless Gateways
Wireless Base Station BSCs/RNCs and BTSs/Node Bs
CTMTSs
LMDS Gateways
Routers
DSLAMs
Media Gateways

FEATURES

Motorola MPC8264A (PowerQUICC II™) on-board processor @ 300 MHz , 570 MIPS

Eight individually software selectable T1/E1/J1 interfaces via:
- Front panel, or
- Rear using 6U RTM

On-board support for multiple network protocols and multiprotocol interworkings:
- ATM (AAL0, 2, 5)
- Q.SAAL/GR-2878
- SS7 (MTP1 & MTP2)
- Frame Relay
- HDLC
- Custom interworking of multiple protocols

Pre-integrated protocol stacks available using Interphase lower layers and various 3rd party upper layer stacks

Two PICMG® 2.16 10/100 Ethernet CPSB compliant ports to the backplane

Hostless functionality allows use without a host processor or a PCI bus on the backplane

Three 10/100 Ethernet interfaces with auto-negotiation (two on the backplane and one on the front panel)

Integrated CSU on T1 lines with support for Facility Data Link

Full hot swap capability

H.110 bus, 512 time slot local-to-H.110 bus, 1024 local-to-local time slots

IPMI System Management support per PICMG 2.9 specification

The new world packet technologies, IP and ATM, have drastically increased the speed of connectivity and flexibility of services at greatly reduced costs and enabled a new generation of applications. In response, the PCI Industrial Computers Manufacturers Group (PICMG) has developed the new CompactPCI® Packet Switching Backplane (CPSB) 2.16 standard to combine the benefits of CompactPCI and Ethernet. Designed to enhance and combine the steadfast, robust capabilities of CompactPCI with the ubiquity of Ethernet, CPSB designs allow engineers to migrate current infrastructures to support these enhancements, rather than replacing previous R&D investments with an entirely new architecture. The CPSB standards provide for improved communication among boards in the system by transmitting data via a switched, high-speed, Ethernet star topology. Giving boards a "system-on-a-card" functionality and providing a "virtual backplane" to interconnect multiple chassis, 2.16 compliance indicates performance, scalability, flexibility, and reliability improvements along with shortened integration time. Interphase takes it further by also offering ATM to Ethernet interworking capability.

The Interphase *i*SPAN® 1635 PMC Quad T1/E1/J1 Communications Controller sets the standard for high-performance and reliability as the industry's most advanced PICMG 2.16-compliant CompactPCI T1/E1/J1 communications controller for telecommunication applications. The 1635 outshines its competition with the industry's best performance, a comprehensive array of protocol and operating system support, and robust development tools to simplify the integration process in either standard CompactPCI systems or new packet switched backplane architectures.

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1635 Software

Reduce time-to-market with robust software development tools

Interphase offers a robust suite of software development tools to help shorten the learning curve and design cycle for integration projects based on the 1635 communications controller. Because integrators and equipment providers have diverse development environments, Interphase provides two types of development tools, each tailored to the needs of different integration types. The Board Development Kit (BDK) facilitates development of device drivers, embedded protocol firmware and applications for the 1635 hardware module. The *i*WARE® Software Development Suite offers developers a set of Interphase-developed firmware protocol stacks, accessible via APIs provided by Interphase.

Summary

- Board Development Kit (BDK)
- VxWorks® Board Support Package (BSP)
- Software Development Suites (SDSs)

Board Development Kit

The 1635 BDK is specific to the 1635 hardware, but it is not tied to a particular operating system environment. The kit contains the following main components:

- Setup Utility: Allows the user to modify the content of the various programmable elements of the board, especially the Flash EEPROM memory.
- Boot Firmware: Provides power-on self test, power-on boot sequence, built-in self test (described below), configuration capability via a command line interface, and boot firmware source files as an example of how to program the card.
- Board Installation and Maintenance Manual: Provides procedures for installing and maintaining the module.
- Hardware Reference Manual: Provides information for developing embedded software and/or host drivers for the module.
- Interactive Built-in Self Test Utility and Monitor Manual: Allows management of the card such as, reset/run action, memory and register dump, memory and DMA tests, line parameter manipulation, and more. Manual provides high-level information for using the boot firmware.

*i*WARE® Software Development Suite

The 1635 *i*WARE Software Development Suite reduces software development time and facilitates faster time to market by supplying embedded protocol support for ATM and SS7, base drivers for a selected operating system, configuration and diagnostic utilities, and sample programs. Please contact your nearest Interphase Sales Representative for future Software Development Suite availability.

Board Support Package

The 1635 Board Support Package (BSP) consists of documentation compiled as a Board Support Guide for VxWorks. This document provides valuable information on how to configure and install VxWorks on the 1635. Once the BSP is installed, the 1635 can be connected to an Ethernet network and development can be done directly from the particular RTOS development environment, such as Tornado. The 1635 Board Support Package also includes the files required to make an RTOS run embedded on the 1635 CPU. The standard BSP is free of charge.

The package provides source files for:

- Interrupt controller
- Flash memory management
- True Flash File System (TFFS) support
- TTY driver
- Ethernet driver (broadcast and multicast support)
- Timestamp driver
- Auxiliary timer support

Also available via the Interphase Professional Services Group:

- Framer device driver framework
- ATM AAL 2 and 5 driver framework
- HDLC driver framework
- PCI driver framework (optional)

Custom Development

Custom software development, integration, and consulting services are also available via the Interphase Professional Services Group. With over 150 man years of development experienced amassed, the professional services team offers everything from completely custom development to merely customizing standard Interphase products to meet your specific needs.

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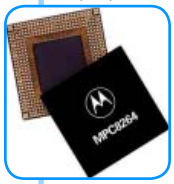
1635 Hardware

Powerful Features for Next-Generation Telecommunications

1635 Architecture

The *i*SPAN 1635 CompactPCI T1/E1/J1 Communications Controller is the flagship product in the Interphase line of MPC8264A-based communications controllers for carrier-class telecommunication environments. The software selectable interfaces for 8 T1/E1/J1 ports enable maximum flexibility to support multiple national variants with just one board.

The T1/E1/J1 framers feed DS0 traffic to an on-board H.110 TDM switch module, which then feeds multiple DS0s to the 8264A for internal processing or to the H.110 TDM bus for I/O to/from other slots. The T1/E1/J1 framers can also simultaneously feed any number of DS0s to the MPC8264A, which then aggregates the DS0s in full or fractional T1 streams into a single ATM pipe to be processed by the 8264A CPM. With this powerful functionality, the 8264A Communications Processor Module (CPM) can simultaneously support multiple protocols including ATM (AAL0, 2, 5 with CBR, VBR, ABR, and UBR Classes of Service), SS7, Frame Relay and others via the internal time slot assigner and the internal UTOPIA bus interface. The 8264A CPM has access to its own 32-bit local bus, where the 128 MB SDRAM are available for unimpeded read/write access to connection and routing tables.



The 8264A features a 64-bit, 66 MHz local data bus connecting 128 MB of SDRAM, 16 MB of boot code flash memory, and a 64-bit wide PowerSpan® PCI bridge. The PowerSpan bridge operates at 33 or 66 MHz on the backplane, supporting several DMA transfer modes for enhanced interprocess communications.

The 1635 is also equipped with three fast Ethernet ports; two RMII interfaces on the backplane and one on the faceplate. The 10/100BaseT ports support full duplex 100 Mbps traffic, and can be used for a variety of bridging/routing purposes, protocol interworking purposes, or simply to download/communicate with the 8264A CPU. Port selection is controlled by software and can be changed dynamically at any time. The two 10/100BaseT interfaces to the backplane are PICMG 2.16 CPSB compliant.

Line Interfaces

- Eight software selectable T1/E1/J1 ports with no component changes between T1, E1, or J1 terminations
- Each RJ-48C line is software configurable in Line Termination or Network Termination mode
- Integrated Channel Service Unit (CSU) in T1 mode
- Front or rear access T1/E1/J1 lines, with rear access provided by the passive Rear Transition Module (RTM)
- QuadFALC™ framer supports long haul & short haul interface, AMI, HDB3, or B8ZS line coding, various superframe formats
- One Mini-DIN TTY console port on front panel

Processor/Memory

- PowerQUICC II (MPC8264A) 64-bit RISC processor for full support of various protocols, reducing host processing
- Dual bus architecture: 64-bit 60x bus and 32-bit local CPM bus; 64-bit, 66 MHz local data bus
- 300 MHz core, 200 MHz CPM, 570 MIPS CPU, up to 700 Mbps CPM protocol engine
- 28 MB 64-bit SDRAM memory, 16 MB downloadable 8-bit Flash Memory, 8 MB 32-bit Connection Memory

Other Features

- Available with and without the PCI bus (sister product 6535 offers PCI bus only; 1635 offers PICMG 2.16 backplane support only or a hybrid version with both the PICMG 2.16 backplane support and the PCI bus)
- PCI 2.2 master/target bus interface, high performance transfers via four DMA channels
- IPMI System Management supported per PICMG 2.9 enables 1635 to function in the absence of a PCI bus
- Stratum 4E clock management, multiple synchronization modes
- Lucent Technologies Ambassador™ H.110 switch controls an H.110 TDM bus on connector J4, with 512 time slots local-to-H.110 bus, 1024 local-to-local time slots
- Full hot swap capability
- Integrated CSU on T1 lines with support for Facility Data Link
- The eight T1/E1/J1 lines can be used with independent clocks (in this case the framers are directly tied to the PowerQUICC II and the H.110 switch is unused)

Tech Specs

Architecture	
Bus Type	CompactPCI, H.110
Bus Data Transfer	64-bit, 66 MHz
Processor	300 MHz Motorola MPC8264A
Memory	128 MB SDRAM
Mechanical	
Form Factor	6U CompactPCI
Length	266.7 mm (10.5 in.)
Width	215.9 mm (8.5 in.)
RTM Length	266.7 mm (10.5 in.)
RTM Width	134.5 mm (5.3 in.)
Operating Environment	
Temperature	0 to 55 °C (32 to 131 °F)
Relative Humidity	5% to 95% non-condensing
Altitude	0 to 15,000 ft.
Power Consumption	5 V: 1.7 A; 3.3 V: 2.0 A

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iSPAN 1635 CompactPCI Quad T1/E1/J1 Communications Controller

Configuration Options

The 1635 compactPCI T1/E1/J1 Communications Controller is available in the following configurations:

CONFIGURATION	ACCESS	BUS SUPPORT	ALIGNMENT KEYS
1635-006	Front	2.16	No
1635-007	Rear	2.16	No
1635-008	Rear	2.16	No
1635-009	Front	PCI & 2.16	No
1635-010	Rear	PCI & 2.16	No
1635-011	Rear	PCI & 2.16	Yes

* Rear access configurations include the Rear Transition Module (RTM).

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