intelligence everywhere™

CPX1200 Family

Low-Profile Carrier-Grade Systems

Performance

- 233 or 366MHz PowerPC® CPU options
- 333 or 500MHz Intel® CPU options
- Industry-standard peripheral and I/O options

Reliability and Availability

- 200W power supply with over 300,000-hour MTBF
- Conforms to PICMG® Hot Swap spec
- Optional alarm module with fan, temperature and "power good" sensing
- Wide-ranging AC and DC input versions
- Hot-swappable fans with filter option

Serviceability

- Front-access service and installation of boards, drives, fans, and power supplies
- Rear connection of power and I/O for easier access to hot swap components
- Detection and remote reporting of power, temperature, and fan fail conditions

Flexibility

- CPX1204 with a CPU, a drive module and three peripheral card slots
- CPX1205 with a CPU and four peripheral card slots
- Optional H.110 bus support

The carrier-grade solution for limited-space environments demanding scalable I/O

Designed for NEBS and ETSI environments, the CPX1200 family of carrier-grade platforms delivers performance, flexibility and serviceability for limited-rack-space telecommunications and central office applications. Based on open architecture CompactPCI® technology, the CPX1200 provides an ideal platform for straightforward integration into central office or enterprise networks for applications such as Voice over IP gateways, cellular base stations, SS7 gateways, ADSL access server, short messaging server and network element manager.

The 3U footprint of the CPX1200 is optimized for front- and rear-access equipment frames and provides I/O density in limited-space environments. CPX1200 design and architecture allow OEMs to integrate their own level of added value and maintain control of the final platform solution.

One of many telecommunications solutions offered by Motorola Computer Group, the CPX1200 enables telecom equipment manufacturers to use their resources better for quicker time to market and better competitive value.

MOTOROLA digital dna™

Standards Compliance

NEBS

The CPX1200 family of systems is intended to meet the requirements of the Bellcore standards, *Network Equipment Building System (NEBS) Requirements: Physical Protection, GR-63-CORE and Electromagnetic Compatibility and Electrical Safety—Generic Criteria for Network Telecommunication Equipment, GR-1089-CORE.* The product is currently being tested to the requirements for NEBS Level 3 criteria.

Criteria	NEBS	
	Specification	**Reference**
Temperature	Normal: 5° C to 40° C Short-term: -5° C to 55° C	GR-63-CORE, R4-7
Relative Humidity	Normal: 5% to 85% RH Short-term: 5% to 90% RH	GR-63-CORE, R4-7
Office Vibration	0.1G @ 5–100Hz with 0.1 octave/min 1.5G @ 100–500Hz with 0.25 octave/min	GR-63-CORE, R4-56 GR-63-CORE, R4-57
Transportation Vibration	5–50Hz @ 0.1 octave/min 50–500Hz @ 0.25 octave/min	GR-63-CORE, R4-58
Earthquake	Zone 4	GR-63-CORE R4-44 to O-55
Drop	Packaged: 600mm drop height Unpackaged: 75mm drop height	GR-63-CORE, R4-41 GR-63-CORE, R4-43
Altitude	-60 to 1800m ASL without temp. derating 1800 to 4000m ASL with temp. derating	GR-63-CORE, R4-8 GR-63-CORE, R4-9 GR-63-CORE, O4-9
Acoustic Noise	60dBA @ 600mm	GR-63-CORE, O4-62
Heat Dissipation	Documentation 300/w/m^2/m max per shelf 38° C max. aisle-facing surface temp. @ 26° C ambient	GR-63-CORE, R4-11 GR-63-CORE, R4-12 GR-63-CORE, O4-13
Fire Resistance and Materials	All material UL94V-1 or better. See GR-63-CORE, Section 4.2	GR-63-CORE, R4-14 to O4-40
Illumination	See GR-63-CORE, Section 4.7	GR-63-CORE, R4-63 to O4-69
Airborne Contaminant	Sulfate: 30 µg/m^3 Nitrite: 12 µg/m^3 Volatile organics: 12 µg/m^3 Sulfur Dioxide: 12 ppb Hydrogen Sulfide: 40 ppb Ammonia: 50 ppb NO: 50 ppb NO_2: 250 ppb HNO_3: 50 ppb Ozone: 250 ppb HCL + Cl_2: 6 ppb	GR-63: R4-59, O4-60

ETSI

The CPX1200 family of systems is intended to meet the requirements of the European Telecom Standard (ETSI) including:

- *Equipment Engineering (EE): Environmental conditions and environmental tests for telecommunications equipment,* ETS 300 019-1-3
- Storage: ETS 300 019-1-1, for Class 1.2 equipment
- Transportation: ETS 300 019-1-2, for Class 2.3 equipment

Criteria	ETSI	
	Specification	**Reference**
Temperature	Storage: -25° C to 55° C Trans.: -40° C to 70° C Operating: -5° C to 45° C	IEC 68-2-1 IEC 68-2-2 IEC 68-2-14
Relative Humidity	Storage: 10% to 100% RH (non-condensing and condensing) Trans.: 95% @ -40° C to 45° C Operating: 5% to 95% RH (non-condensing and condensing)	IEC 68-2-56 IEC 68-2-30
Vibration	Storage: 1.5mm @ 2–9Hz, 0.5G @ 9–200Hz Trans. sinusoidal: 3.5mm @ 2–9 Hz, 1G @ 9–200 Hz, 1.5Gs @ 200–500Hz Trans. random: 1 m^2/s^3 @ 10–200 Hz, 0.3 m^2/s^3 @ 200–2000Hz. Operating: 1.5mm @ 2–9Hz, 0.5 G @ 9–200Hz	IEC 68-2-6 IEC 68-2-36
Shock	Storage, Type I: 4Gs @ 22ms Trans., Type I: 30Gs @ 11ms Operating: 4Gs @ 22ms	IEC 68-2-27 IEC 68-2-29
Drop	Trans.: 1.2m free fall	IEC 68-2-32
Load	Storage: 5 kPa Trans.: 10 kPa	N/A
Altitude	-471 to 3708m ASL	N/A
Acoustic Noise	7.2 bels @ 1m	ETS 300 753 ISO 7779
Fire Resistance and Materials	All material UL 94V-1 or better	UL1950 UL94 BS2782 Part 1 (ISO 181)
Airborne Contaminant	SO_2: 0.3/1.0 mg/m^3 H_2S: 0.1/0.5 mg/m^3 Salt mist: sea and road salt CL_2: 0.1/0.3 mg/m^3 HCl: 0.1/0.5 mg/m^3 NO_x: 0.5/1.0 mg/m^3 NH_3: 1.0/3.0 mg/m^3 HF: 0.01/0.03 mg/m^3 O_3: 0.05/0.1 mg/m^3 Dust sedimentation: 20 mg/m^2h Dust suspension: 5 mg/m^3	N/A

Ordering Information

Starter Kits

Starter kits are functional hardware platforms with the PPCBug firmware installed on each PowerPC CPU card and a Phoenix® BIOS installed on each Intel Architecture CPU card (see Software Support section for more details).

CPX1204SK10 Pentium II Network Bootable Starter Kit

This system provides a basic, network-bootable, NEBS compliant computing node with front-accessible serial and dual 10/100 Ethernet, plus:

- 266MHz Pentium II CPU, 32MB RAM, and 16MB Flash chipset
- Rear fan module
- Three available I/O slots
- AC power supply and front fan module
- AC power input module
- Front and rear filler panels in all slots

CPX1204SK20 PowerPC Network Bootable Starter Kit

This system provides a basic, network-bootable, NEBS compliant computing node with front-accessible PMC, serial and 10/100 Ethernet, plus:

- 233 MHz PowerPC 750 CPU, 32MB RAM, and 10MB CompactFlash™
- Rear fan module
- Three available I/O slots
- AC power supply and front fan module
- AC power input module
- Front and rear filler panels in all slots

CPX1204SK11 Pentium II Disk Based Starter Kit

This system provides for media-based booting via floppy or CD-ROM. Front or rear connectivity is provided for the CPU which is housed in a NEBS compliant chassis. Key features include:

- 266MHz Pentium II CPU, 32MB RAM, and 16MB Flash chipset
- Three available I/O slots
- Floppy disk drive
- EIDE CD-ROM
- Rear transition module for CPU
- AC power supply and front fan module
- AC power input module
- Front and rear filler panels in all slots
- 4GB EIDE hard drive

CPX1204SK21 PowerPC Disk Based Starter Kit

This system provides for media-based booting via floppy or CD-ROM. Front or rear connectivity is provided for the CPU which is housed in a NEBS compliant chassis. Key features include:

- 233MHz PowerPC 750 CPU, 32MB RAM, and 10MB CompactFlash
- Three available I/O slots
- Floppy disk drive
- EIDE CD-ROM
- Rear transition module for CPU
- AC power supply and front fan module
- AC power input module
- Front and rear filler panels in all slots
- 4GB EIDE hard drive

A bezel option provides a decorative covering for the front of the chassis. It also has an area suitable for OEM labeling.

CPX1200 Series OEM Configuration Options

CPX1200 systems can be tailored to your unique applications from the following functions. Contact your local sales representative for assistance.

Chassis

- 4-slot CompactPCI chassis, AC or DC power options, standard or H.110 backplane; can be used with drive carrier
- 5-slot CompactPCI chassis, AC or DC power options, standard or H.110 backplane
- Front bezel option

Alarm Module

- CPX1200 alarm board and fan module

System Controller CPU Modules

- 233 or 366MHz PowerPC CPU module with 32, 64, 128 or 256MB DRAM
- 333 or 500MHz Pentium II CPU module with 16MB EIDE Flash chipset and 32, 64, 128 or 256MB EDO DRAM

CompactFlash Drive Options

- 10, 20, 48, or 96MB CompactFlash drives for PowerPC CPU

Transition Module Options

- Rear transition module
- Rear transition module w/alarm interconnect
- Transition module serial port 3 and 4 options: EIA-232 DCE or DTE; EIA-530 DCE or DTE; V.35 DCE or DTE (PowerPC CPUs)
- Rear transition module w/LVD SCSI controller (Pentium CPUs)

Non-System Processor Modules

- 233 or 366MHz PowerPC CPU module with 32, 64, 128 or 256MB ECC DRAM and optional rear Ethernet
- 333 or 500MHz Pentium II CPU module with 16MB EIDE Flash chipset and 128 or 256MB SDRAM, Ethernet, USB and graphics

PMC Options

- Hot swap PMC carrier card
- 10/100BaseTX PMC module
- Fast and Wide SCSI-2 single-ended PMC module

Peripherals

- 1.44MB 3.5-inch floppy disk drive
- EIDE 4GB 2.5-inch hard disk drive
- EIDE 6GB 2.5-inch hard disk drive
- SCSI 9 or 18GB 3.5-inch hard disk drive
- EIDE CD-ROM drive
- NS20 3.5-inch tape drive

OEM Customization Services

Motorola Computer Group provides a wide range of customization options including:

- Labeling and marking options
- Electrical and/or mechanical modifications
- Hardware integration
- Software integration
- Third-party device integration
- Single-point service and FRU point of contact

Contact your Motorola Computer Group Sales representative for additional information.

Specifications

Chassis

Size: 5.25" (133.35mm) high (3U), 18.90" (480mm) wide, including mounting flanges, 15.00" (381mm) deep, from mounting flanges

Weight: Approx. 30 lb. (13.6kg) unloaded, 35 lb. (15.9kg) fully loaded

Mounting: Rackmount per EIA Standard RS-310-C in 19" rack, or in 23" rack with mounting brackets

Slots:

- Four (CPX1204/1204T) or five (CPX1205/1205T) 4HP CompactPCI slots including:
  - One system processor slot
  - Three or four hot swap I/O slots
- One drive module slot (CPX1204/1204T only)
- Five 80mm transition slots, IEEE 1101.10 compatible
- One unused 6U slot and transition slot for disk expansion and/or cable routing

Power Supplies: Front accessible with blind mate connections to backplane and power input module

Fans: Four 12VDC, 60mm x 25mm, 25CFM axial fans; front accessible and hot swappable, with fault detection and filter option

Air flow: Two front inlet fans and two rear exhaust fans in a push-pull, N+1 configuration

ESD Ground: Two ESD ground points, one front and one rear

Earth Ground: Two points at rear, per NEBS requirements

Metal: Cold rolled steel

Metal Plating: Zinc chromate, clear

Marking: Slots locations are silk screened using black, Helvetica bold type on adhesive-backed overlays (IBM pearl white)

PowerPC CPU Card (MCP750)

Processor: 233MHz or 366MHz PowerPC 750

Memory: Up to 256MB DRAM, 1MB L2 cache, CompactFlash IDE flash drive

I/O: EIDE, 10/100 Ethernet, USB, serial (sync/async), parallel

I/O Access: Front and rear

PMC Site: Yes

For additional information on the MCP750, visit our product catalog at http://www.motorola.com/computer/products.

Intel Architecture CPU Card (CPV5350)

Processor: 333MHz or 500 MHz Pentium II

Memory: Up to 128MB DRAM, 16MB Flash chipset configured as IDE primary master

I/O: AGP with 8MB video memory, EIDE, dual 10/100 Ethernet, USB, serial (sync/async), parallel

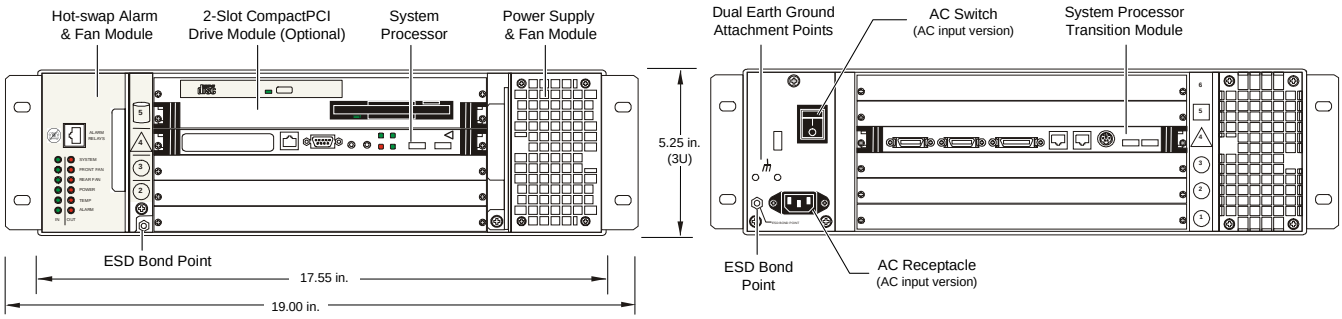
I/O Access: Front and rear

For additional information on the CPV5350, visit our product catalog at http://www.motorola.com/computer/products.

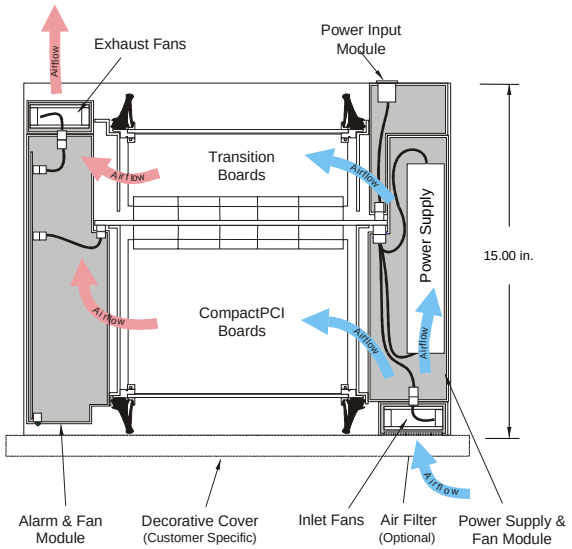
Backplane

CPX1200 backplane features include:

- 64-bit CompactPCI, Hot Swap compliant
- One system processor slot
- Three (CPX1204) or four (CPX1205) standard CompactPCI I/O slots
- Three (CPX1204T) or four (CPX1205T) H.110 capable I/O slots
- DC power distribution from power supply output to CompactPCI boards
- Alarm signal routing from system controller to alarm module
- Floppy and IDE drive interface routing from system controller to the optional drive module (CPX1204/1204T only)



CPX1204 Front and Rear



CPU Rear Transition Module

Rear transition modules are available to provide rear access to CPU I/O.

External SCSI Controller Transition Module

The external SCSI controller transition module provides all of the CPU's rear I/O connections. In addition, the transition board provides a low voltage differential (LVD) capable SCSI controller for rear connection to LVD devices such as external RAID arrays. The SCSI controller connects to the secondary local PCI bus available on P4 of HA capable system controller CPUs such as the MCP750 and CPV5350.

Alarm and Exhaust Module

CPX1200 alarm and exhaust fan module connects to the backplane and provides exhaust fan power connections, alarm control and front panel fault indication. The alarm circuitry is connected to fan tachometer outputs, the "Power Good" signal from the power supply, and the temperature sensing device on the alarm board. The alarm status is communicated over the backplane to the system processor via Serial Port 2 (MCP750 series) or System Management Bus (CPV5350 series). Features include:

Fans:	Two 60mm x 25mm, 12 VDC axial fans
Connection:	Hot swap, blind mate connection to the backplane
Front Panel Indicators:	Power, temperature and fan failure; System In and Out of Service indication
Output:	Front panel RJ-45 connector with central office compliant, dry contact relay, remote alarm connections

Alarm Board Software Drivers

To interface the alarm board functionality to operating system environments, MCG will make source code available for the software driver and alarm board firmware for both PowerPC and Intel architectures. Drivers contain a sample application and the alarm API that provides the programmatic interface to control and monitor the alarm board using a simple command-line interface.

Exhaust-only Module (no alarm capability)

A lower-cost version of the exhaust module is also available without the alarm features.

CompactPCI Drive Module (CPX1204/1204T only)

The CPX1204 or CPX1204T can accept a plug-in drive module that installs into the top of the chassis card cage. The drive module can support a variety of device combinations:

- Floppy and 3.5-inch hard drive (IDE or SCSI)
- Floppy and two 2.5-inch hard drives (IDE)
- NS20 tape and 2.5-inch hard drive (IDE)
- NS20 tape and two 2.5-inch hard drives (IDE)
- Two 3.5-inch hard drives (SCSI)
- Floppy only or NS20 only
- 3.5-inch hard drive only (IDE or SCSI)
- CD-ROM, floppy and 2.5-inch hard drive (IDE)
- CD-ROM and two 2.5-inch hard drives (IDE)
- CD-ROM and 2.5-inch hard drive (IDE)

IDE and floppy interfaces are routed over the backplane from the system processor user-defined I/O pins to the corresponding pins in slot 5. The drive module carrier board then plugs into slot 5, and connects the IDE and floppy interfaces to the appropriate drives. A SCSI controller is provided on the drive module carrier board that connects to the CompactPCI backplane bus at slot 5, and provides single-ended SCSI control of the internal SCSI devices.

Power Supply and Fan Modules

The CPX1200 power supply module houses the 150-watt power supply and fan module. An industry-standard, open frame supply is enclosed in a sled assembly that supports the power supply, fan assembly, blind mate connectors, and interconnect wiring harness. Two different build versions support different AC and DC input voltages. Each supply version must be matched to a corresponding input power module.

Electrical Specifications

Power Factor:	0.95 W/VA per EN61000-3-2
Inrush Current:	35A peak at 230 VAC for one line cycle, 35A peak at -72 VDC within 4 ms
Efficiency:	Greater than 65% at full load, 110 VAC
Output Power:	150 watts in this application
Hold-Over Storage:	20ms at full load, 90 VAC
Transient Response:	All outputs return to 1% within 1 ms of a 50% load change
Dynamic Load:	The supply operates properly when subjected to a 10% load delta with a 50% duty cycle, from 0 to 2MHz
Over-Voltage Protection:	5V output < 6.4VDC 3.3V output < 4.2VDC Recycle on/off switch to reset
Short-Circuit Protection:	Latch off if any output is shorted to any other output; automatic recovery upon removal of short

Module DC Output

150 Watt +5V Main DC Load Requirements

Output Voltage	Min. Load	Max. Load	Regulation	Ripple P/P
+3.3V	3.0A	15.0A	±2%	50mV
+5.0V	3.0A	30.0A	±2%	50mV
+12.0V	0.3A	3.0A	±3.5%	120mV
–12.0V	0.3A	3.0A	±3.5%	120mV
Total combined current for 5V and 3.3V not to exceed 30A. Total combined current for 12V and –12V not to exceed 5A. Total power for 12V and –12V output not to exceed 60W.				

150 Watt +3.3V Main DC Load Requirements

Output Voltage	Min. Load	Max. Load	Regulation	Ripple P/P
+3.3V	3.0A	30.0A	±2%	50mV
+5.0V	3.0A	15.0A	±2%	50mV
+12.0V	0.3A	3.0A	±3.5%	120mV
–12.0V	0.3A	3.0A	±3.5%	120mV
Total combined current for 5V and 3.3V not to exceed 30A. Total combined current for 12V and –12V not to exceed 5A. Total power for 12V and –12V output not to exceed 60W.				

200 Watt +5v Main DC Load Requirements

Output Voltage	Min. Load	Max. Load	Regulation	Ripple P/P
+3.3V	0.5A	15.0A	±2%	50mV
+5.0V	3.0A	30.0A	±2%	50mV
+12.0V	0.3A	6.0A	±3.5%	120mV
–12.0V	0.3A	2.0A (3.0A peak)	±3.5%	120mV
Total combined current for 5V and 3.3V not to exceed 30A. Total combined current for 2V and –12V not to exceed 5A. Total power for 12V and –12V output not to exceed 60W.				

Power Distribution Module

Power distribution modules must match the AC or DC input version of the power supply.

AC Input Version

- 85–264VAC input, at 47–63Hz
- 2.0A maximum input current at 115VAC
- 1.0A maximum input current at 230VAC
- Double-pole rocker on/off switch
- IEC standard 6A AC input receptacle

DC Input Version

- –36VDC to –72VDC input
- 6.4A maximum input current at –36VDC
- 4.5A maximum input current at –48VDC
- Single-pole circuit breaker

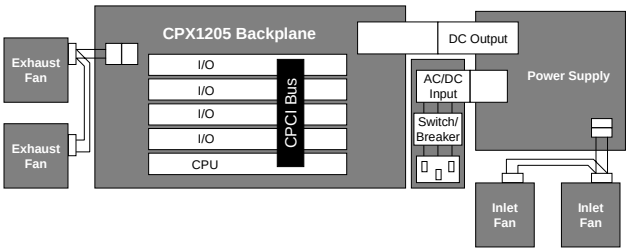
Cooling Features

- Four 2.40" (60mm) x 1.0" (25mm) DC axial fans in push-pull, N+1 redundant configuration
- Cooling sensor that detects airflow and temperature changes
- Software monitoring
- Ducting provides forced air to power supply, CompactPCI boards, and transition boards
- Air filter option

Serviceability

Hot swap components provide for potential field repair without loss of service. All active components are Field Replaceable Units (FRUs), thus minimizing service time for the majority of fault conditions.

Field Replaceable Units	Hot Swap	Mean time to Replace
CompactPCI boards	Yes	<5 min.
Transition modules	Yes	<5 min.
Power supply and inlet fan sled	Yes (inlet fan only)	<5 min.
Power distribution module		<5 min.
Alarm/Exhaust fan sled	Yes	<5 min.



Demonstrated MTBF

(based on a sample of eight units in accelerated stress environment)

Mean: 107, 161 hours

95% Confidence: 60, 570 hours

Regulatory Compliance

Motorola configured systems meet or exceed the following:

Safety: CSA NRTL/C, VDE EN60950 agency listed, CE Mark per European Low Voltage Directive 72/23/EEC

EMC: U.S.: FCC Part 15, Subpart B, Class A
Canada: ICES-003, Class A
Europe: CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class A; Immunity: EN50082-1

Warranty

The CPX1200 series is offered with a five-year limited warranty which reduces the cost of ownership, provides investment protection and demonstrates our commitment to quality and reliability of products to our OEM partners. Additional warranty information can be obtained at http://www.motorola.com/computer/support.

Software Support

The CPX1200 series is supported by a variety of general-purpose and real-time operating systems. Additional information can be obtained from the partners listed below. You can also visit our Web site at http://www.motorola.com/computer or contact your local sales representative for up-to-date OS support.

Real-Time Operating Systems

- LynxOS® from Lynx Real-Time Systems, www.lynx.com
- VxWorks® from Wind River Systems, www.wrs.com
- OSE™ from Enea OSE Systems, www.enea.com
- QNX® Neutrino® from QNX Software Systems Ltd., www.qnx.com

General-Purpose Operating Systems

- Windows NT®, www.microsoft.com
- Linux®

Fault Management Software

Motorola offers a complete line of Advanced High Availability Software, featuring our award winning HA-Linux product, http://www.motorola.com/telecom.

Standard Firmware

PowerPC CPUs contain firmware that includes basic features like power-up tests and comprehensive diagnostics as well as evaluation and debug tools for simple or high-level development support. Diagnostics include loop backs, register tests, and memory address/data tests. It also supports booting of operating systems and/or real-time kernels.

Intel architecture CPUs have a Phoenix BIOS that provides:

- Auto-configuration, extended setup, Plug-and-Play tables
- Diskless, keyboardless, and videoless operation extensions
- Programmable bus and I/O speeds and memory wait states
- System, video, and SCSI BIOS shadowing
- BIOS POST and Setup console redirection to serial port

MOTOROLA

www.motorola.com/computer
1-800-759-1107

Motorola Computer Group
2900 S. Diablo Way
Tempe, AZ 85282

Regional Sales Offices

Canada & Central Pan America
400 Matheson Blvd. West
Mississauga, Ontario
L5R 3M1 Canada
905-507-7136 or 888-366-3624

Eastern Pan America
120 Turnpike Rd, 1st Floor
Southborough, MA 01772
508-357-8260

Western Pan America
1150 Kifer Road, Suite 100
Sunnyvale, CA 94086
408-991-8634

Asia Pacific and Japan
40/F Nat West Tower
Times Square, 1 Matheson St
Causeway Bay, Hong Kong
852-2966-3209

East Mediterranean
6 Kremenetski Street
Tel Aviv 67899 Israel
972-3-568-4388

France
Zone Technopolis - Immeuble
THETA 3, avenue du Canada - BP304
91958 LES ULIS
Courtaboeuf Cedex, France
+33 (0) 1 64 86 64 00

Germany
Hagenauer Strasse 47
D-65203 Wiesbaden, Germany
+49 (0) 611-3611 604

Benelux
De Waal 26, 5684 PH Best
PO Box 350, 5680 AJ Best
Netherlands
+31 4993 61250

Nordic
Dalvagen 2
S-169 56 Solna, Sweden
+46 (0) 8 734 8800

United Kingdom
London Road, Old Basing,
Basingstoke, Hampshire
RG24 7JL England
+44 (0) 1256 790555