cPCI-6841 Series

6U CompactPCI Pentium M
Single Board Computers
User's Manual

Manual Rev. 2.01

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1 Introduction

The cPCI-6841 is a 6U CompactPCI single board computer based on the Intel® Pentium® M processor and 855GME/ICH4 chipset. The Pentium® M processor's operating frequency ranges from 1.3GHz up to 2.0GHz and it comes with 1MB/2MB L2 cache in an FC-mPGA package. The combination of the longevity of the Intel® 855GME/ICH4 chipset and low power consumption of the Pentium® M CPU make the cPCI-6841 the ideal solution for embedded applications.

The 855GME supports a 400MHz FSB and DDR333 memory up to 2GB via two SODIMM sockets. An integrated 32-bit 3D graphic controller provides analog VGA or DVI output.

The low power consumption ICH4 southbridge provides a 33MHz PCI bus with highly integrated I/O features, including one USB 2.0 port and two E-IDE channels. The ICH4's PCI bus is connected to one PMC site, two 82541GI Gigabit Ethernet (GbE) controllers, and a TI PCI-2050 PCI to PCI bridge. The 32-bit/33 MHz PMC site provides high expansion capability and flexibility for various applications.

The cPCI-6841 is equipped with two Gigabit Ethernet (GbE) ports. Two GbE ports use the 82541GI GbE controllers on the 33MHz PCI bus to achieve the full communication bandwidth between the LAN and CPU. These two ports are connected to the front panel.

Please refer to the following block diagram for the cPCI-6841 architecture.

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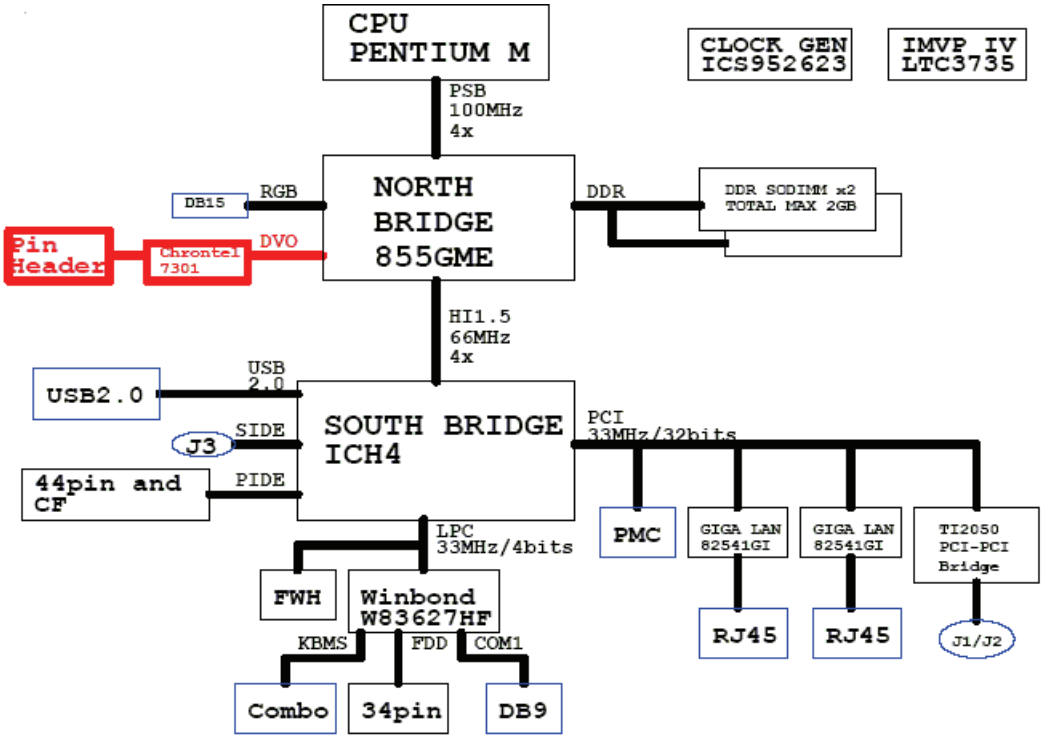


Figure 1-1: cPCI-6841 Block Diagram

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1.1 Main Functions

The following sections explain the main functions of the cPCI-6841.

CPU Support

The cPCI-6841 SBC is designed for the Intel® Pentium® M and Celeron® M Processors. The standard cPCI-6841 SBC comes with CPU socket which can be installed with μFC-PGA2 package CPU, with the following options:

- Pentium® M 1.4GHz, 1.6GHz, 1.7GHz, 1.8GHz, and 2.0GHz
- Celeron® M 1.3GHz

The Low Voltage (LV) or Ultra Low Voltage (ULV) version of the Pentium® M or Celeron® M Processors, which are in μFCBGA2 packages, can also be mounted on the cPCI-6841 SBC. However, μFCBGA2 CPU support is reserved for OEM programs only. The possible CPU options include:

- LV Pentium® M 1.1GHz, 1.2GHz, 1.3GHz
- ULV Celeron® M 600MHz

CompactPCI Bus Interface

The TI Technology PCI-2050 is a universal PCI to PCI bridge and is used to implement the system slot on the cPCI-6841. The cPCI-6841 CompactPCI bus supports 32-bit/33 MHz PCI.

PCI Mezzanine Card (PMC) Interface

The cPCI-6841 supports one PMC slot at 32-bit/33 MHz PCI, providing expansion capability and flexibility for varieties of applications.

IDE and CompactFlash Interfaces

The cPCI-6841 supports dual Ultra ATA100 IDE channels. Primary IDE is implemented on the cPCI-6841 and Secondary IDE is routed to the backplane via the J3 connector. A 44-pin connector for 2.5 inch IDE drives is reserved on the Primary IDE interface.

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Gigabit Ethernet Ports

The cPCI-6841 has two 10/100/1000Mbps Ethernet (GbE) ports. Every port is assigned a unique static MAC Address. Two onboard Intel® 82541GI Gigabit Ethernet controllers provide two Ethernet ports and are implemented on a 32-bit/33 MHz PCI bus. The 82541GI supports IEEE 802.3x compliant flow control and IEEE 802.3ab compliant 10/100/1000 Mbps auto-negotiation. Two RJ-45 connectors for these two LAN ports are located on the front panel for system management or service requirements.

Universal Serial Bus (USB)

The cPCI-6841 provides one USB 2.0 port on the front panel for use as an interface to versatile peripherals such as keyboard, mouse, printer, USB flash disk, etc.

Serial I/O

One serial port is supported by the Winbond W83627HF Super I/O on the cPCI-6841 and is accessed via a DB-9 connector on the front panel. This port will be configured as Data Terminal Equipment (DTE). BIOS will initialize the serial port as COM1 with ISA I/O base addresses of 3F8h and with a default setting of COM1 assigned to IRQ4.

Keyboard/Mouse Controller

The cPCI-6841 uses the Winbond W83627HF Super I/O to implement the keyboard/mouse controller. The controller is fully 8042 compatible. The cPCI-6841 provides a proprietary combo PS2 connector on the front panel (a cable is included).

FDD Interface

The cPCI-6841 uses the Winbond W83627HF Super I/O to implement the Floppy interface. Signals are available at the FDD connector.

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Watchdog Timer

The cPCI-6841 implements a watchdog timer (WDT) using the Winbond W83627HF Super I/O. The programmable I/O port is on address 2E, and the timer can be set for 1 to 255 seconds or 1 to 255 minutes. Easy-programming libraries for DOS and Windows 95/98/NT are included.

Hardware Monitoring

The cPCI-6841 uses the Winbond W83627HF Super I/O to detect system voltages and temperatures. When it detects that the voltages or temperatures out of the safety range, it will instruct the southbridge ICH4 to send the signals out halting the system in order to protect the CPU board.

Operating System Support

The cPCI-6841 is compatible with Microsoft® Windows 2000, Windows 2003 Server, Windows XP, Red Hat Linux 9 and VxWorks 5.5. The device drivers for Windows are included on the ADLINK CD. For Linux support and VxWork BSP, please contact ADLINK.

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1.2 Features

- Low power consumption, supports Intel® Pentium® M and Celeron® M CPUs from 1.3GHz up to 2.0GHz
- Low power consumption Intel® 855GME and ICH4 embedded chipset, provides longevity for OEM
- Compliant with PICMG 2.0, R3.0
- 32-bit/33 MHz CompactPCI interface based on PCI specifications
- One 32-bit/33 MHz PMC site
- Two 200-Pin DDR SODIMM sockets support up to 2GB DDR333 SDRAM
- Provides both IDE and FDD interfaces for storage devices.
- Full feature I/O ports, including VGA, KB, MS, USB 2.0, COM port, two GbEs, and optional DVI or PMC

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1.3 Product List

The cPCI-6841 series products include the following SBCs:

SBC

- cPCI-6841: Pentium® M SBC with PMC slot
- cPCI-6841-2: Pentium® M SBC with DVI output

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1.4 Specifications

cPCI-6841 SBC Specifications

CompactPCI Compliancy

- PICMG 2.0 CompactPCI Rev. 3.0

Form Factor

- Standard 6U CompactPCI (board size: 233.35mm x 160mm)
- Single slot width (4TE or 4HP, 20.32mm)

CPU/Cache

- Single Intel® Pentium® M 1.4GHz, 1.6GHz, 1.7GHz, 1.8GHz, 2.0GHz or Celeron® M 1.3GHz Processors with μFC-PGA package
- 1MB or 2MB on die L2 cache, 400MHz FSB

Chipset

- Intel® 855GME Graphics Memory Controller Hub (GMCH)
- Intel® 82801DB I/O Hub (ICH4)

Host Memory

- Two 200-pin DDR SODIMM sockets, 2GB maximum
- Supports DDR333 SDRAM

BIOS

- Phoenix/Award Plug and Play BIOS with 4Mb Flash ROM
- BIOS write protection, provides anti-virus capability
- Bootable from USB storage devices including USB-Floppy, USB-ZIP, USB-CD-ROM, and USB-HDD.
- Onboard Ethernet ports can be disabled via BIOS setting
- Optional customized OEM splash image / power on screen

Note: Due to BIOS segment limitations, enabling the remote console function may occupy the same memory space as other ROM mapping add-on or boot-up devices such as Pre-boot Agent of Ethernet Boot ROM, SCSI Boot ROM, or add-on EIDE Boot ROM. It is recommended that only one ROM-mapping add-on or boot-up device be enabled when enabling the remote console function.

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CompactPCI Bus Controller

- TI PCI-2050 PCI-to-PCI bridge
- PCI Rev 2.2 compliant
- Supports 32-bit/33 MHz

Graphics

- Integrated into 855GME Graphics Memory Controller Hub
- Shared memory, up to 32MB
- Dual channel display
- Front panel DVI connector is available on cPCI-6841-2 only

Gigabit Ethernet

- Two 10/100/1000bps Gigabit Ethernet ports
- GbE ports are implemented through Intel® 82541GI Ethernet controllers, based on 32-bit/33 MHz PCI bus, RJ-45 connectors on the front panel

Onboard Peripherals

- Integrated into Intel® 82801DB (ICH4) southbridge
- Bus master IDE controller supports two ultra ATA-100 interfaces
  - Primary IDE is on SBC with 44-pin IDE connector and a CF slot. A 2.5 inch IDE HDD can be mounted.
  - Secondary IDE port is routed to J3
- USB Rev. 2.0 compliant port
  - USB connectors are on the front panel
  - USB ports support 0.5A@5V for peripherals with individual over-current protection
- RS-232 serial port. COM is on the front panel with DB-9 type connector
- PS2 keyboard / mouse connector on the front panel

Front Panel LED Indicators and Reset Button

- Four LEDs on the front panel, including storage access LED (RED), Power LED (green), General Purpose LED (blue), and Watchdog Timer LED (yellow).
- Flush tact switch for system reset.

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Real -Time Clock and Nonvolatile Memory

- Built into Intel® 82801DB southbridge RTC
- Battery-backed memory is used for BIOS configuration
- Separate 3V coin cell CR2032 battery used for RTC and nonvolatile memory

Environment

- Operating temperature: 0 to 45°C(1)
- Storage temperature: -40 to 80°C
- Humidity: 5% to 95% non-condensed
- Shock: 15G peak-to-peak, 11ms duration, non-operation
- Vibration:(2)
  - Non-operation: 1.88Grms, 5-500Hz, each axis
  - Operation: 0.5Grms, 5-500Hz, each axis, with 2.5” HDD

Safety Certificates and Tests

- CE, FCC Class A
- All plastic material, PCB and Battery used are all UL-94V0 certified
- Designed for NEBS 3.0 requirements

Note 1: Certified with ADLINK thermal design. The thermal performance is dependent on the chassis cooling design. Forced air-cooling with 50 CFM is required. Temperature limit of optional mass storage devices can impact the thermal specification.

Note 2: Operational vibration is limited by the 2.5 inches HDD. When application requires higher definition for anti-vibration, we recommend using Flash disk or CompactFlash.

Power Requirements

Configuration	+5V	+3.3V	+12V	-12V	Total
Single Pentium® M 1.6GHz 512MB RAM, 40GB HDD	10.1A	2.28A	0.25A	20mA	61W

Table 1-1: Power Ratings

Note: Power consumption measured under Windows 2000 SP4, executing KPOWER and Burn-In-Test.

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I/O Connectivity

Function	cPCI-6841		cPCI-6841-2	
	Face-plate	On Board	Face-plate	On Board
COM	Y (DB-9)	---	Y (DB-9)	---
VGA	Y (DB-15)	---	Y (DB-15)	---
PS2	Y (Combo)	---	Y (Combo)	---
USB2.0	Y	---	Y	---
LAN x 2	Y (RJ-45)		Y (RJ-45)	
CF	---	Y (IDE 1)	---	Y (IDE 1)
DVI	---	---	Y	---
PMC	Y	Y (32-bit/33 MHz)	---	---
IDE 1	---	Y (44-pin)	---	Y (44-pin)
FDD	---	Y (34-pin)	---	Y (34-pin)
LEDs	Y	---	Y	---
Reset Button	Y	---	Y	---

Table 1-2: I/O Connectivity Table

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1.5 Unpacking Checklist

Check the shipping carton for any damage. If the shipping carton and contents are damaged, notify the dealer for a replacement. Retain the shipping carton and packing materials for inspection by the dealer. Obtain authorization before returning any product to ADLINK.

Check that the following items are included in the package, if there are any items missing, please contact your dealer.

SBC:

- The cPCI-6841 or cPCI-6841-2 SBC (May be equipped with different specifications of CPU, RAM, and HDD)
- This User's Manual
- ADLINK All-in-One CD
- Y Cable for Keyboard and Mouse

Note: The packaging of OEM versions with non-standard configuration, functionality, or package may vary according to different configuration requests.

CAUTION: The boards must be protected from static discharge and physical shock. Never remove any of the socketed parts except at a static-free workstation. Use the anti-static bag shipped with the product to handle the board. Wear a grounded wrist strap when servicing



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2 Jumpers and Connectors

This chapter illustrates the board layout, connector pin assignments, and jumper setings. Users should be familiar with the products before use. The following sections are included:

- cPCI-6841 and cPCI-6841-2 board outline
- cPCI-6841 and cPCI-6841-2 connectors pin assignments
- cPCI-6841 and cPCI-6841-2 jumper settings

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2.1 cPCI-6841 Series Mechanical Drawings

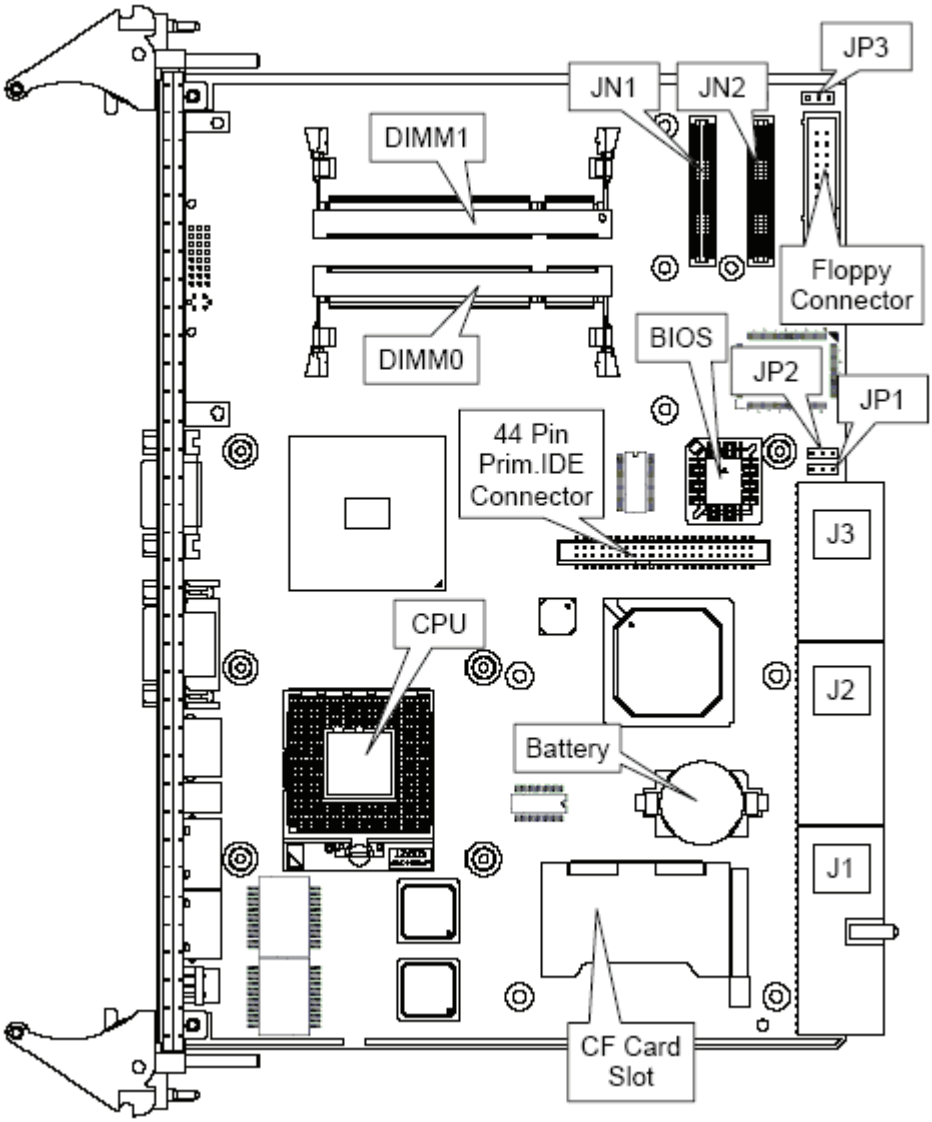


Figure 2-1: cPCI-6841 Top View

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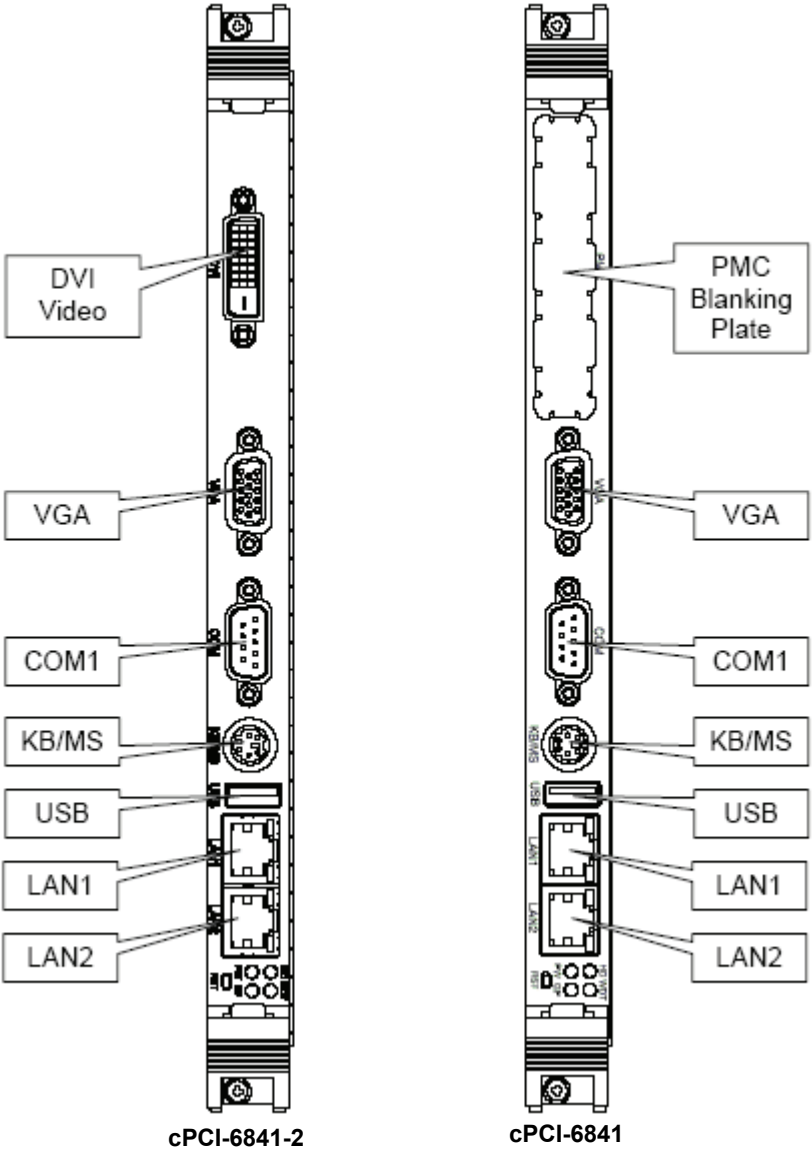


Figure 2-2: cPCI-6841 and cPCI-6841-2 Front View

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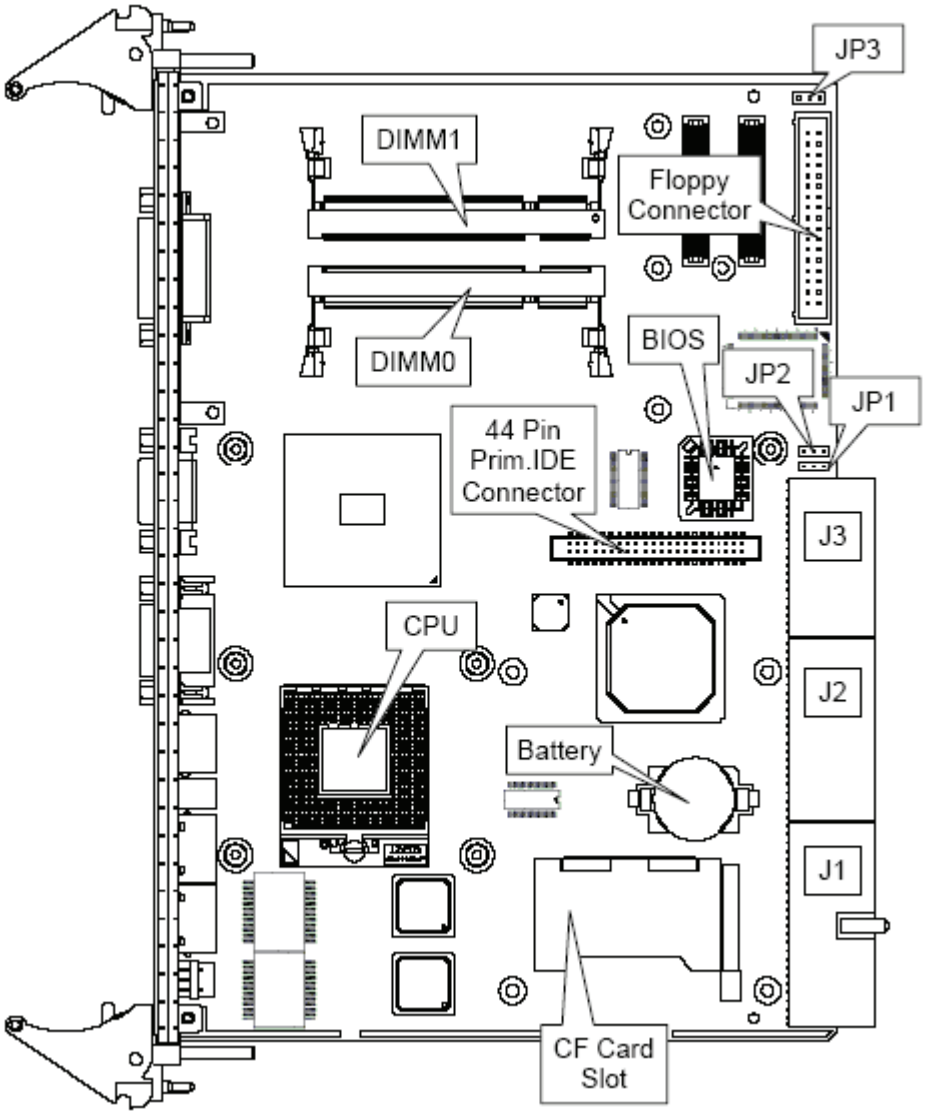
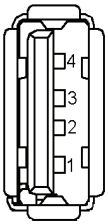


Figure 2-3: cPCI-6841-2 Top View

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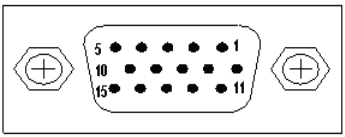
2.2 cPCI-6841 Series Pin Assignments

USB Connectors



PIN	SIGNAL
1	VCC
2	USB-
3	USB+
4	Ground

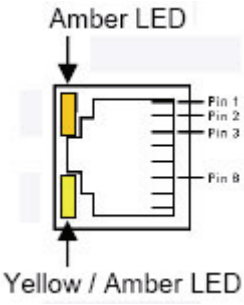
VGA Connector



Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
+5V	9	10	GND
N.C.	11	12	DDCDAT
HSYNC	13	14	VSYNC
DDCCLK	15		

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Ethernet (RJ-45) Connector



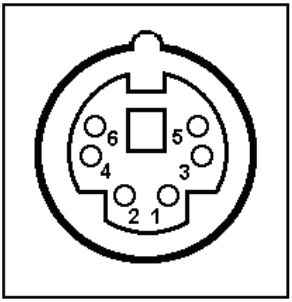
Pin #	Signal Name	Function
1	LAN_TDP1	Transmit Data1 +
2	LAN_TDN1	Transmit Data1 -
3	LAN_RDP2	Receive Data2 +
4	LAN_RDP3	Receive Data3 +
5	LAN_RDN3	Receive Data3 -
6	LAN_RDN2	Receive Data2 +
7	LAN_TDP4	Transmit Data4 +
8	LAN_TDN4	Transmit Data4 -

Status		Left LED (Yellow or Amber)	Right LED (Amber)
Network link is not established		OFF	OFF
10 Mbps (10 BaseT)	Link	OFF	Amber
	Active	OFF	Blinking Amber
100 Mbps (100 BaseTX)	Link	Yellow	Amber
	Active	Yellow	Blinking Amber
1000 Mbps (1000 BaseT)	Link	Amber	Amber
	Active	Amber	Blinking Amber

Table 2-1: Ethernet LED Status

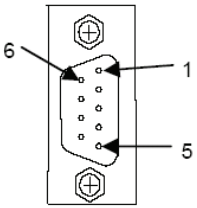
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PS2 Connector



Pin	Signal	Function
1	KBDATA	Keyboard Data
2	MSDATA	Mouse Data
3	GND	Ground
4	+5V	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

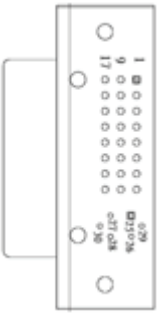
RS-232 Serial Port Connector



Pin	Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring in

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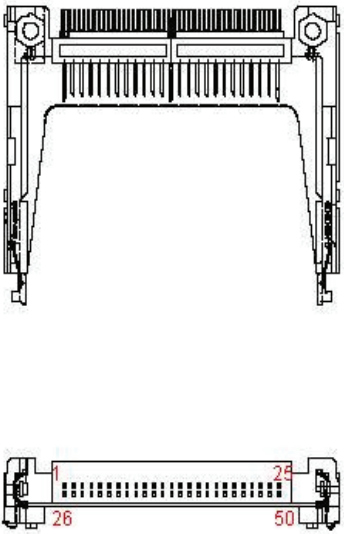
DVI Connector



Pin	Signal	Pin	Signal
1	TX2-	16	HTPLG
2	TX2+	17	TX0-
3	GND	18	TX0+
4	NC	19	GND
5	NC	20	NC
6	I2CCLK	21	NC
7	I2CDATA	22	GND
8	VSYNC	23	TXC+
9	TX1-	24	TXC-
10	TX1+	25	RED
11	GND	26	GREEN
12	NC	27	BLUE
13	NC	28	HSYNC
14	+5V	29	GND
15	GND	30	GND

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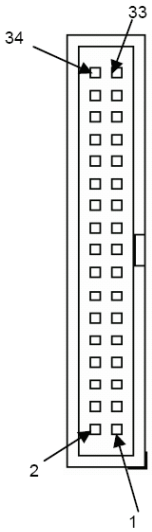
CompactFlash Connector



Signal Name	Pin	Pin	Signal Name
GND	1	26	GND
SDD3	2	27	SDD11
SDD4	3	28	SDD12
SDD5	4	29	SDD13
SDD6	5	30	SDD14
SDD7	6	31	SDD15
SDCS#1	7	32	SDCS#3
GND	8	33	GND
GND	9	34	SDIOR#
GND	10	35	SDIOW#
GND	11	36	+5V
GND	12	37	IDEIRQ15
+5V	13	38	+5V
GND	14	39	PCSEL
GND	15	40	NC
GND	16	41	SIDERST#
GND	17	42	SIORDY
SDA2	18	43	NC
SDA1	19	44	SDDACK#
SDA0	20	45	IDEACT#
SDD0	21	46	S66DECT
SDD1	22	47	SDD8
SDD2	23	48	SDD9
IOIS16#	24	49	SDD10
GND	25	50	GND

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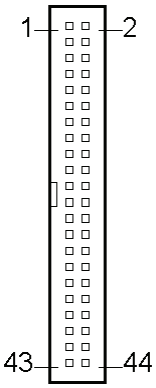
Floppy Connector



Signal Name	Pin	Pin	Signal Name
GND	1	2	Extended Density
GND	3	4	NC
NC	5	6	Data Rate
GND	7	8	Index
GND	9	10	Motor A Select
GND	11	12	Drive B Select
GND	13	14	Drive A Select
GND	15	16	Motor B Select
GND	17	18	Step Direc-tion
GND	19	20	Step Pulse
GND	21	22	Write Data
GND	23	24	Write Gate
GND	25	26	Track 0
GND	27	28	Write Protect
GND	29	30	Read Data
GND	31	32	Side 1
GND	33	34	Disk Change

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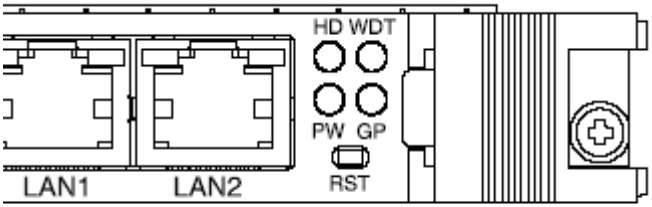
IDE Connector



Signal Name	Pin	Pin	Signal Name
BRSTDRVJ	1	2	GND
DDP7	3	4	DDP8
DDP6	5	6	DDP9
DDP5	7	8	DDP10
DDP4	9	10	DDP11
DDP3	11	12	DDP12
DDP2	13	14	DDP13
DDP1	15	16	DDP14
DDP0	17	18	DDP15
GND	19	20	NC
PDDREQ	21	22	GND
PDIOWJ	23	24	GND
PDIORJ	25	26	GND
PIORDY	27	28	PCSEL
PDDACKJ	29	30	GND
IRQ14	31	32	NC
DAP1	33	34	DIAG
DAP0	35	36	DAP2
CS1P	37	38	CS3PJ
IDEACTPJ	39	40	GND
+5V	41	42	+5V
GND	43	44	NC

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General Purpose LED definitions



LED	Color	Status	Description
IDE Media Access	Red	OFF	IDE idle
		ON	IDE access
Power OK	Green	OFF	System is not power-on or power failed
		ON	Power ON
General Purpose LED	Blue	OFF	User defined
		ON	User defined
WDT LED	Yellow	OFF	WDT is not enabled
		Blinking	WDT is enabled

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PMC Connector Pin Assignments (JN1, JN2)

Signal Name	JN1 Pin		Signal Name	Signal Name	JN2 Pin		Signal Name
TCK(3)	1	2	-12V	+12V	1	2	TRST#(3)
GND	3	4	INTA#	TMS(2)	3	4	TDO(1)
INTB#	5	6	INTC#	TDI(2)	5	6	GND
BM1(1)	7	8	+5V	GND	7	8	N/C
INTD#	9	10	N/C	N/C	9	10	N/C
GND	11	12	+3.3V	BM2(2)	11	12	+3.3V
CLKP1	13	14	GND	RST#	13	14	BM3(3)
GND	15	16	GNT0#	+3.3V	15	16	BM4(3)
REQ0#	17	18	+5V	PME#	17	18	GND
VIO(4)	19	20	AD31	AD30	19	20	AD29
AD28	21	22	AD27	GND	21	22	AD26
AD25	23	24	GND	AD24	23	24	+3.3V
GND	25	26	CBE3#	IDSEL	25	26	AD23
AD22	27	28	AD21	+3.3V	27	28	AD20
AD19	29	30	+5V	AD18	29	30	GND
VIO(4)	31	32	AD17	AD16	31	32	CBE2#
P1FRAME#	33	34	GND	GND	33	34	IDSL_B(1)
GND	35	36	IRDY#	TRDY#	35	36	+3.3V
DEVSL	37	38	+5V	GND	37	38	STOP#
GND	39	40	LOCK#	PERR#	39	40	GND
N/C	41	42	N/C	+3.3V	41	42	SERR#
PAR	43	44	GND	CBE1#	43	44	GND
VIO(4)	45	46	AD15	AD14	45	46	AD13
AD12	47	48	AD11	M66EN	47	48	AD10
AD9	49	50	+5V	AD8	49	50	+3.3V
GND	51	52	CBE0#	AD7	51	52	REQ_B#(1)
AD6	53	54	AD5	+3.3V	53	54	GNT_B#(1)
AD4	55	56	GND	N/C	55	56	GND

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Signal Name	JN1 Pin		Signal Name	Signal Name	JN2 Pin		Signal Name
VIO(4)	57	58	AD3	N/C	57	58	EREADY(1)
AD2	59	60	AD1	GND	59	60	RSTOUT#(1)
AD0	61	62	+5V	ACK64#	61	62	+3.3V
GND	63	64	REQ64#	GND	63	64	Monarch#(1)

Note 1: These signals are not connected on the board.

Note 2: These signals are pulled high on the board.

Note 3: These signals are pulled low on the board.

Note 4: The VIO signals by default set to +5V via jumper JP3.

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CompactPCI J1 Pin Assignment

Pin	Z	A	B	C	D	E	F
25	GND	+5V	REQ64#	ENUM#(4)	+3.3V	+5V	GND
24	GND	AD [1]	+5V	V (I/O)	AD [0]	ACK64#	GND
23	GND	+3.3V	AD [4]	AD [3]	+5V	AD [2]	GND
22	GND	AD [7]	GND	+3.3V	AD [6]	AD [5]	GND
21	GND	+3.3V	AD [9]	AD [8]	M66EN	C/BE [0]#	GND
20	GND	AD [12]	GND	V (I/O)	AD [11]	AD [10]	GND
19	GND	+3.3V	AD [15]	AD [14]	GND	AD [13]	GND
18	GND	SERR#	GND	+3.3V	PAR	C/BE [1]#	GND
17	GND	+3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND
16	GND	DEVSEL#	GND	V (I/O)	STOP#	LOCK#	GND
15	GND	+3.3V	FRAME#	IRDY#	BDSEL	TRDY#	GND
12-14	Key						
11	GND	AD [18]	AD [17]	AD [16]	GND	C/BE [2]#	GND
10	GND	AD [21]	GND	+3.3V	AD [20]	AD [19]	GND
9	GND	C/BE[3]#	IDSE	AD [23]	GND	AD [22]	GND
8	GND	AD [26]	GND	V (I/O)	AD[25]	AD [24]	GND
7	GND	AD [30]	AD [29]	AD [28]	GND	AD [27]	GND
6	GND	REQ#	GND	+3.3V	CLK	AD [31]	GND
5	GND	Reserved(1)	Reserved(1)	PCIRST#	GND	GNT#	GND
4	GND	IPMB_PWR	HEALTHY#	V (I/O)	INTP(1)	INTS	GND
3	GND	INTA#	INTB#	INTC#	+5V	INTD#	GND
2	GND	TCK(3)	+5V	TMS(2)	TDO(1)	TDI(2)	GND
1	GND	+5V	-12V	TRST#(3)	+12V	+5V	GND

Note 1: These signals are not connected.

Note 2: These signals are pulled high on the board.

Note 3: These signals are pulled low on the board.

Note 4: To support PICMG 2.1 hotswap for peripheral boards, the backplane should bus the ENUM# signal of all peripheral slots to the system board. The ENUM# signal is continuously polled by the system board's hotswap firmware and will gen-

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erate an interrupt when an ENUM# signal is detected.

CompactPCI J2 Pin Assignment

Pin	Z	A	B	C	D	E	F
22	GND	GA4(2)	GA3(2)	GA2(2)	GA1(2)	GA0(2)	GND
21	GND	CLK6	GND	BRSV(1)	BRSV(1)	BRSV(1)	GND
20	GND	CLK5	GND	BRSV(1)	GND	BRSV(1)	GND
19	GND	GND	GND	ICMBSDA(1)	ICMBSCL(1)	ICMBALR(1)	GND
18	GND	BRSV(1)	BRSV(1)	BRSV(1)	GND	BRSV(1)	GND
17	GND	BRSV(1)	GND	PRST#	REQ6#	GNT6#	GND
16	GND	BRSV(1)	BRSV(1)	DEG#	GND	BRSV(1)	GND
15	GND	BRSV(1)	GND	FAL#	REQ5#	GNT5#	GND
14	GND	AD [35]	AD [34]	AD [33]	GND	AD [32]	GND
13	GND	AD [38]	GND	V (I/O)	AD [37]	AD [36]	GND
12	GND	AD [42]	AD [41]	AD [40]	GND	AD [39]	GND
11	GND	AD [45]	GND	V (I/O)	AD [44]	AD [43]	GND
10	GND	AD [49]	AD [48]	AD [47]	GND	AD [46]	GND
9	GND	AD [52]	GND	V (I/O)	AD [51]	AD [50]	GND
8	GND	AD [56]	AD [55]	AD [54]	GND	AD [53]	GND
7	GND	AD [59]	GND	V (I/O)	AD [58]	AD [57]	GND
6	GND	AD [63]	AD [62]	AD [61]	GND	AD [60]	GND
5	GND	C/BE [5]#	GND	V (I/O)	C/BE [4]#	PAR 64	GND
4	GND	V (I/O)	BRSV(1)	C/BE [7]#	GND	C/BE [6]#	GND
3	GND	CLK4	GND	GNT3#	REQ#4	GNT4#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

Note 1: These signals are not connected.

Note 2: These signals are pulled high on the board.

Note 3: These signals are pulled low on the board.

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CompactPCI J3 Pin Assignment (optional)

Pin	Z	A	B	C	D	E	F
19	GND	PCIRST-L	NC	SIDE_IORDY	NC	IDEIRQ15	GND
18	GND	SIDE_DACT-L	NC	SIDE_CS-L3	SIDE_CS-L1	SIDE_66DECT	GND
17	GND	SIDE_D15	SIDE_D14	SIDE_D13	SIDE_D12	NC	GND
16	GND	SIDE_D11	SIDE_D10	SIDE_D9	SIDE_D8	SIDE_DACK-L	GND
15	GND	SIDE_A0	SIDE_A1	NC	SIDE_A2	SIDE_DREQ	GND
14	GND	SIDE_D7	SIDE_D6	SIDE_D5	SIDE_D4	SIDE_IOW-L	GND
13	GND	SIDE_D3	SIDE_D2	SIDE_D1	SIDE_D0	SIDE_IOR-L	GND
12	GND	FDD_DS0-L	FDD_DRATE0	FDD_MTR0-L	FDD_INDEX-L	FDD_DATA-L	GND
11	GND	FDD_DS1-L	FDD_DSKCHG-L	FDD_MTR-L	FDD_DENSEL-L	FDD_RDATE-L	GND
10	GND	FDD_WP-L	FDD_HDSEL-L	FDD_DIR-L	FDD_TRKO-L	FDD_STEP-L	GND
9	GND	FDD_GATE-L	NC	NC	NC	NC	GND
8	GND	NC	NC	NC	NC	NC	GND
7	GND	NC	NC	NC	NC	NC	GND
6	GND	NC	NC	NC	NC	NC	GND
5	GND	NC	MSDATA	NC	KBDATA	NC	GND
4	GND	NC	MSCLK	NC	KBCLK	NC	GND
3	GND	NC	NC	NC	NC	NC	GND
2	GND	NC	NC	NC	NC	NC	GND
1	GND	NC	NC	NC	NC	NC	GND

Note: J3 is reserved for OEM versions. With ADLINK's customized backplanes, the secondary IDE and FDD ports can be connected to devices in the chassis.

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2.3 cPCI-6841 Series Switch and Jumper Settings

The following table lists the switch and jumpers on the cPCI-6841 and cPCI-6841V.

Switch	Function
SW1	Reset
JP1	Select CF as Master or Slave
JP2	Clear CMOS Content
JP3	PMC VIO

Table 2-2: Switch and Jumper Functions

SW1: Reset Button

SW1 is a push-button on the front panel. Pressing SW1 generates a hard reset.

JP1: CF Master or Slave Selection

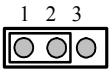
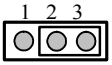
Status	JP1
CF Slave (Default)	
CF Master	

Table 2-3: JP1 Settings

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JP2: Clear CMOS

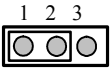
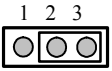
Status	JP3
Normal operation (Default)	
Clear CMOS	

Table 2-4: JP2 Settings

The CMOS RAM stores the real time clock (RTC) information, BIOS configuration, and default BIOS setting. The CMOS is powered by a button cell battery when the system is powered off.

Please use the following procedure to erase the CMOS RAM data:

1. Remove the SBC from the system
2. Short pins 2 and 3 of JP2, then reinstall the jumper to its normal default location
3. Insert the SBC back into the chassis.

JP3: PMC VIO Selection

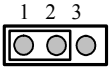
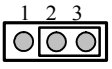
Status	JP1
PMC VIO is set to 5V (Default)	
PMC VIO is set to 3.3V	

Table 2-5: JP3 Settings

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3 Getting Started

This chapter explains how to install necessary components on the cPCI-6841 and cPCI-6841-2 including:

- CPU and heat sink
- Memory module installation
- HDD installation
- PMC installation (cPCI-6841 only)
- CF card installation
- Main board installation

3.1 CPU and Heatsink

The cPCI-6841 and cPCI-6841-2 support the Intel® Pentium® M processor. The heat sink is necessary to help with CPU heat dissipation. Please follow the procedures below to install the CPU and heat sink. (If the CPU and heat sink are already installed, you may skip this section.)

CPU Installation

Fully turn the CPU locking screw counter-clockwise as far as it will go as shown in **Figure 3-1: CPU Installation** below. Carefully place the CPU into the CPU socket. Be sure to align the gold triangle on the corner of the chip with the triangular marking in the corner of the socket. Press down gently on the chip to ensure that it is securely in place, and then fully turn the CPU locking screw clockwise as far as it will go to lock the CPU into position. Peel the mylar film from the white side of the thermal pad included with the heatsink kit and place it on the CPU as shown (pink side up). Then remove the film protecting the top side of the the thermal pad.

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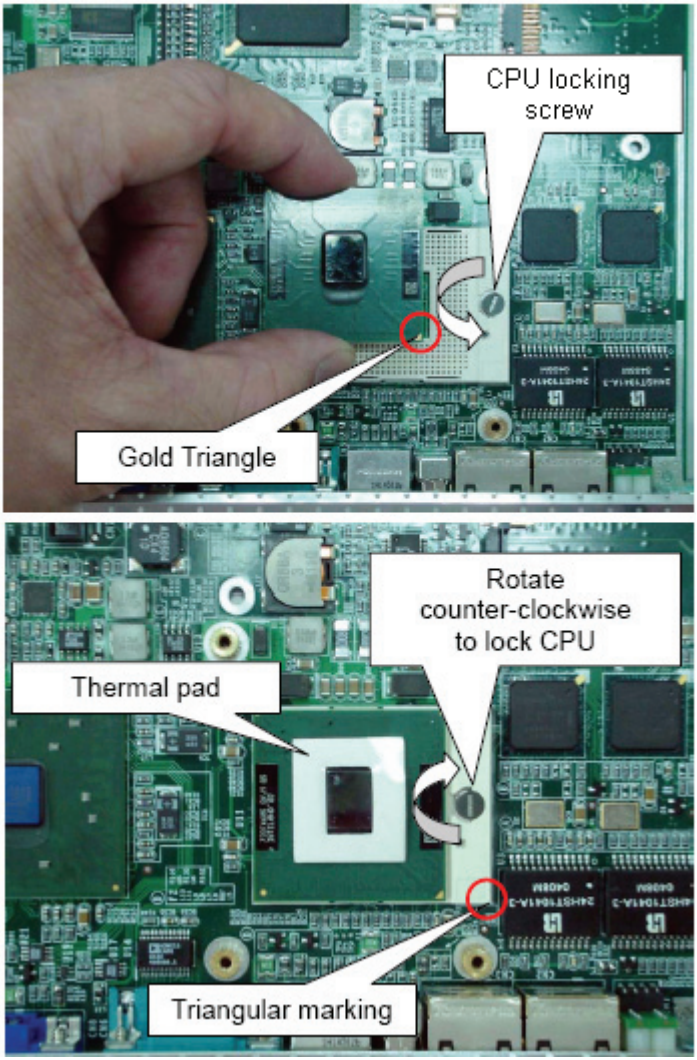


Figure 3-1: CPU Installation

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Heatsink Installation

Remove the film protecting the thermal pads on the heatsink as shown in **Figure 3-2: Heatsink Installation** below. Place the heatsink on the CPU and northbride, ensuring that the thermal pads make proper contact with the board components. Secure using the 6 spring-loaded screws provided

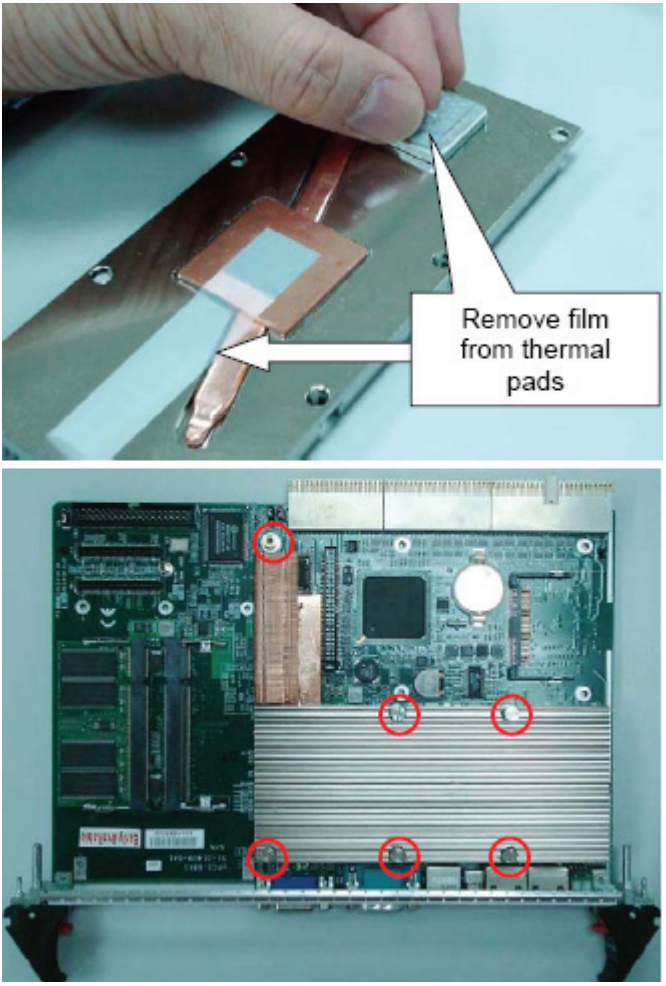


Figure 3-2: Heatsink Installation

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3.2 Memory Module Installation

The cPCI-6841 Series SBC provides two 200-pin SODIMM sockets for DDR-SDRAM with a maximum memory capacity of 2GB. If memory modules are pre-installed when the package is received, this section may be skipped.

The GMCH system memory controller directly supports the following:

- One channel of DDR SDRAM memory
- DDR SDRAM devices with densities of 128-Mb, 256-Mb, and 512-Mb technology
- Up to 2GB (512-Mb technology) using high density devices with two DIMMs

Technology	Width	System Memory Capacity	System Memory Capacity with Stacked Memory
128Mb	16	256MB	-
256Mb	16	512MB	-
512Mb	16	1GB	-
128Mb	8	256MB	512MB
256Mb	8	512MB	1GB
512Mb	8	1GB	2GB

Table 3-1: DDR SDRAM Memory Capacity

To install the memory modules, align the notch in the memory module with the key on the DIMM slot and follow the procedure shown in **Figure 3-3 below**. When installing memory, ensure that each DIMM module is firmly seated in its socket and does not interfere with any components.

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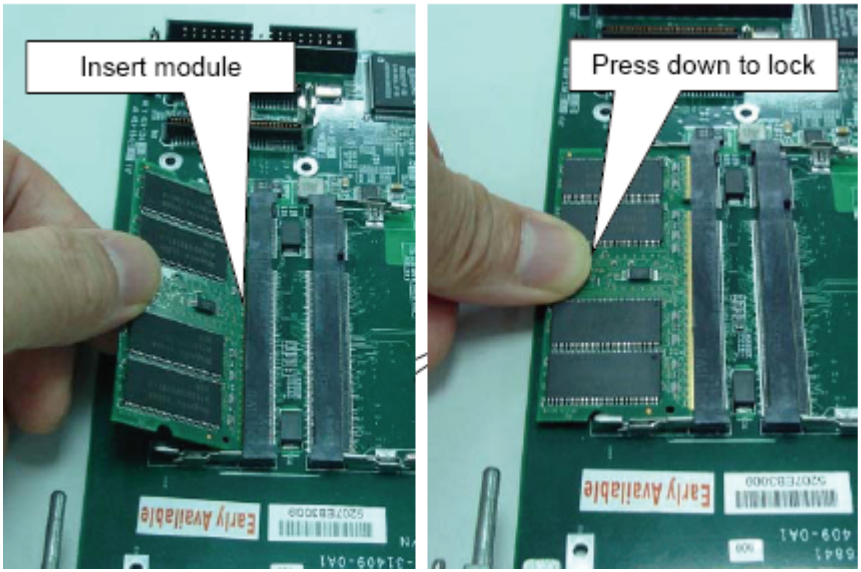


Figure 3-3: Memory Installation

3.3 PCI Mezzanine Card (PMC) Installation (cPCI-6841 only)

The PMC slot is designed for 5V and/or universal PCI interfaces. The PMC site is keyed to prevent users from installing a 3.3V only PMC module.

To install the PMC modules:

1. Prepare an ESD protected area including an anti-ESD table and ESD strap. Attach the ESD strap to your wrist and connect the end of the ESD strap to ground of the anti-ESD table.
2. Remove the PMC blanking plate from the front panel.
3. Install the PMC module onto the board by aligning the PMC sockets and voltage selection keys and then pushing down firmly on the module.

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4. Screw the four PMC mounting bolts to the main board from the bottom side of the SBC to secure the PMC module in place.

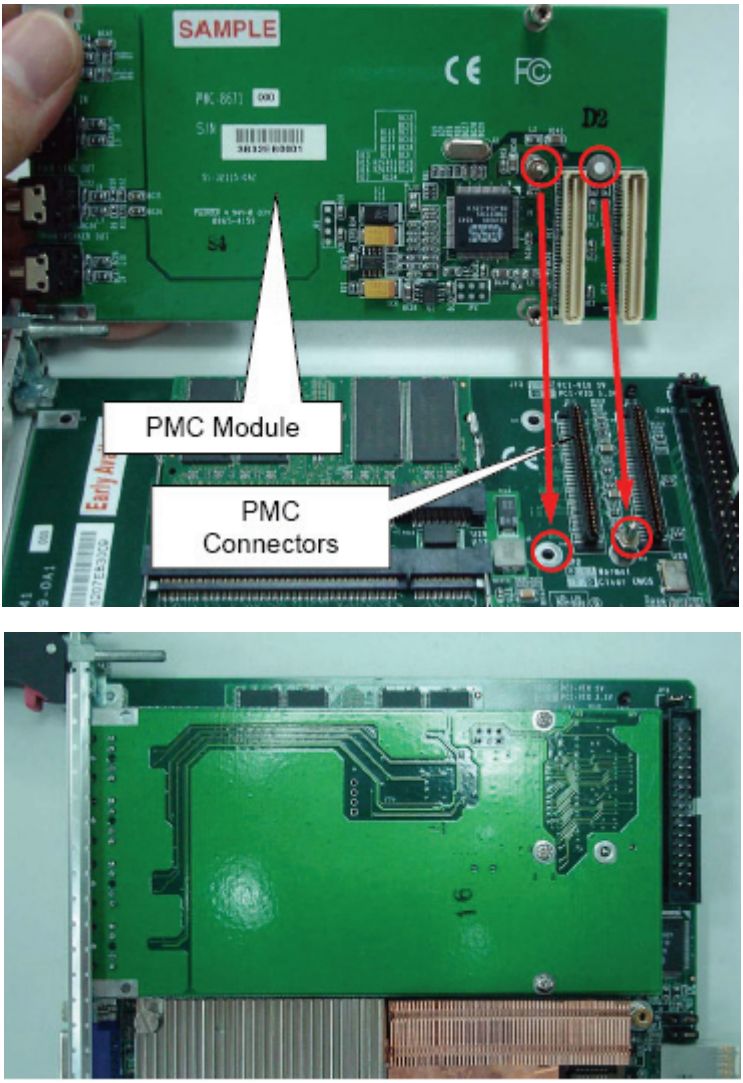


Figure 3-4: PMC Installation 1

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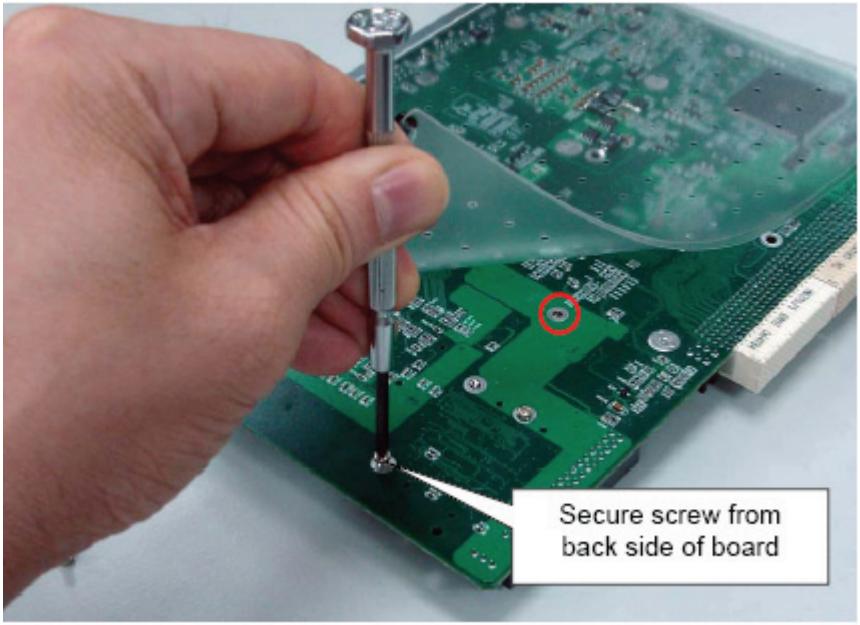


Figure 3-5: PMC Installation 2

3.4 HDD Installation on Main Board

A slim-type 2.5-inch HDD can be mounted on the cPCI-6841 or cPCI-6841-2. If a HDD is pre-installed, this section may be skipped.

1. Screw the provided standoffs onto the HDD and attach the included 44-pin IDE cable.
2. Place the HDD onto the board as shown and connect the IDE cable to the socket. Tighten the four screws from the bottom side of the main board to secure the HDD in to place.
3. Press the IDE cable into the shape shown to avoid interference when inserting and removing the board.

Please refer to the illustrations shown below to install your 2.5” hard disk.

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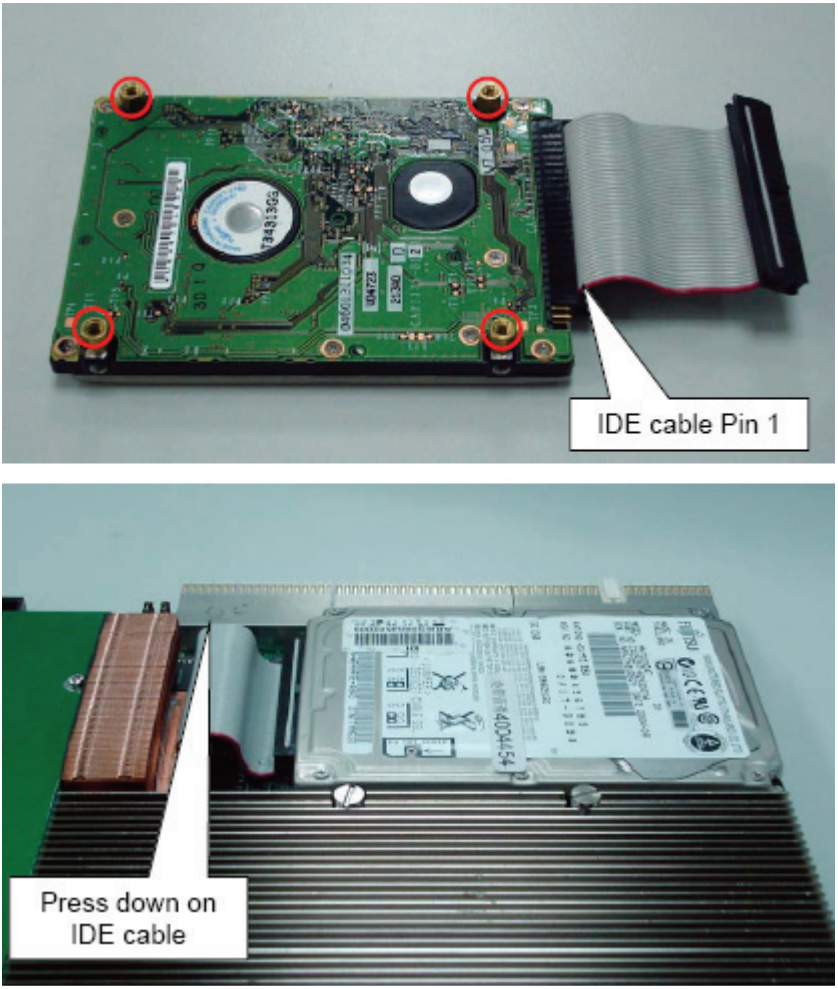


Figure 3-6: cPCI-6841 2.5" Hard Disk Installation

3.5 CF Installation (cPCI-6841 only)

The CompactFlash card is widely applied in digital consumer devices such as PDAs, digital cameras and MP3 players. Due to its anti-shock/anti-vibration properties, better environmental toler-

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ance, low power consumption, small form factor, and high reliability characteristics, it has been widely accepted in mission critical embedded applications.

To install the CF card, insert it into the socket located under the HDD as shown.

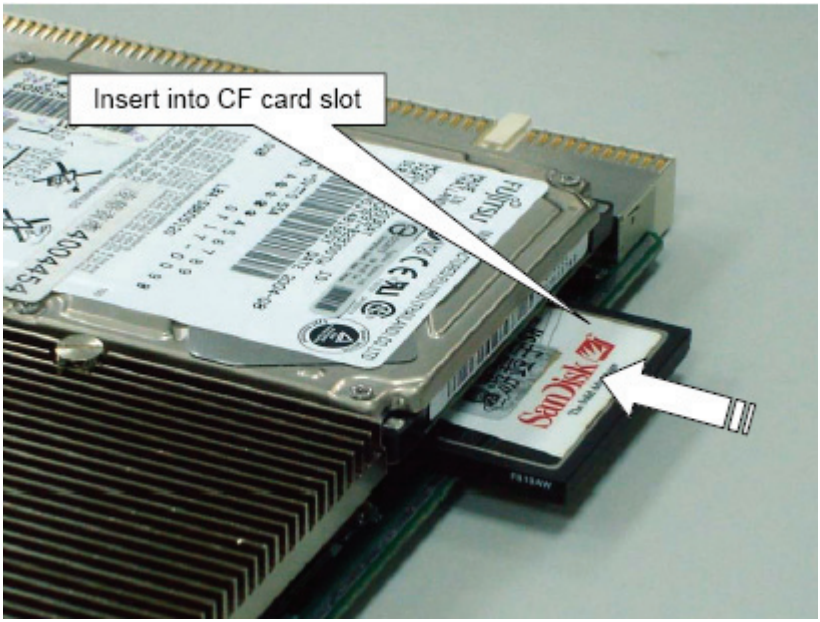


Figure 3-7: CompactFLASH Card Installation

3.6 Main Board Installation

Use the following procedure to install the cPCI-6841/cPCI-6841-2 main board into a CompactPCI chassis.

1. Refer to the relevant chassis user manual for pre-preparation of the chassis before installing the main board. Users need to assign a slot to the board. Be sure to select the correct slot (system or peripheral) depending

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on the operational purpose of the board. The chassis power may now be turned on.

2. Remove the blank face panel from the slot.
3. Align the top and bottom edges of the board with the card guides on the chassis then slide the board into the chassis until resistance is felt. If the system power is on, the green LED (power status) will light up.
4. Move the upper and lower ejectors in an inward direction simultaneously. Note that a slight resistance will be felt while inserting the board. If this resistance is more than normal, check to ensure that there are no pins bent on the backplane and that the board's connector pins are aligned properly with the connectors on the backplane.
5. Secure the two screws hidden behind the upper and lower ejector; connect the necessary cables to the board.

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4 Windows Driver Installation

The following sections show the driver installation procedures for Windows 2000, Windows XP or Windows Server 2003. When installing the Windows drivers, we recommend the following steps:

1. Fully install the Windows properly before installing any driver. Most of the standard I/O devices' driver will be installed during the standard Windows installation.
2. Install the chipset driver.
3. Install the graphic driver and utilities.
4. Install the LAN drivers.

It is recommended that the chipset, graphic, and LAN drivers provided on the ADLINK All-in-One CD be used to ensure compatibility. Please contact ADLINK for support for Linux drivers and VxWorks BSP.

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4.1 Chipset Drivers Installation

1. Ensure your Windows operating system is fully installed and running prior to executing the “Intel Chipset Software Installation Utility”.
2. Close any running applications.
3. The files are stored in an integrated application setup program. This program is designed for Windows 2000, XP and Windows Server 2003.
4. Locate the directory X:\cPCI\cPCI-6841\Chipset on the ADLINK All-in-One CD, and then run “infinst_enu.exe”.
5. Click 'Next' on the Welcome screen to read and agree to the license agreement. Click Yes if you agree to continue. NOTE: If you click No, the program will terminate.
6. Click ‘Next’ on the Readme Information screen to install INF files.
7. Click “Finish” to restart the system when prompted to do so.
8. Follow the screen instructions and use the default settings to complete the setup when Windows 2000/XP/Windows Server 2003 re-starts.

4.2 VGA Driver Installation

1. Boot Windows 2000/XP/Windows Server 2003.
2. The driver is included on the ADLINK All-in-One CD. Run the file win2k_xp142.exe under the following directory: X:\cPCI\cPCI-6841\\VGA.
3. Click ‘Next’ on the Welcome screen. Select ‘Typical’ on the setup type screen and click Next’.
4. Use the default program folders on the Select Program Folder screen. Click ‘Next’ to install driver.
5. Finally, click 'Finish' to restart.

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4.3 LAN Driver Installation

1. Boot Windows 2000/XP/Windows Server 2003.
2. Run the pro2kxp.exe under the following directory: X:\cPCI\cPCI-6841\LAN.
3. Read the license agreement. Click 'I accept the terms in the license agreement' if you agree to continue.
4. At the Location to Save Files prompt, click Next to save the files in the specified folder.
5. To install Intel® PRO Network Connections, click Install Software to install drivers and Intel PROSet.

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5 Utilities

5.1 Watchdog Timer

This section explains the operation of the cPCI-6841's watchdog timer. The primary function of the watchdog timer is to monitor the cPCI-6841 Series SBC's operation and to reset the system if the software fails to function as programmed. The watchdog timer can be software controlled in the following ways:

- enabled and disabled
- reloading timeout value

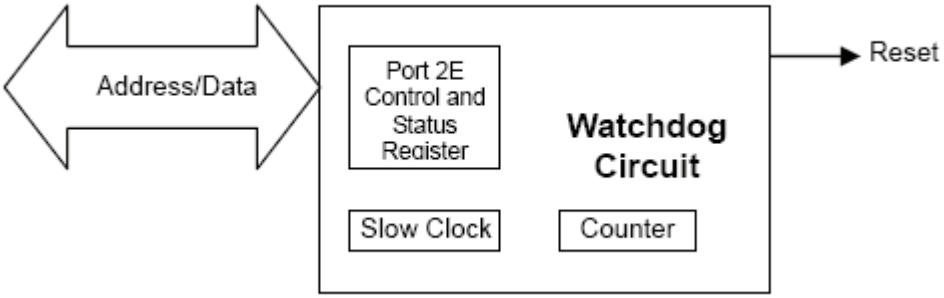


Figure 5-1: cPCI-6841 Watchdog Timer Architecture

The CPCI-6841 Series custom watchdog timer circuit is implemented using the Winbond W83627HF. It contains three Registers (CRF5, CRF6 and CRF7 of logical device 8) for controlling the watchdog timer and retrieving its status. The basic functions of the watchdog timer are:

- Set the timeout interval of the watchdog
- Start timer count down
- Enable/disable watchdog
- Reload the timeout value to keep watchog from timing out
- Set the range of the timeout period from 1 to 255 seconds, or 1 to 255 minutes. It is set by control register.

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Once the watchdog has timed out, it will cause a RESET signal to be sent to the system.

5.2 Using the Watchdog in an Application

The following section is provided to assist you in learning how to use the watchdog in an application. The watchdog's Reset function is as explained above. It can be controlled through the registers of the Super I/O on the cPCI-6841.

An application using the Reset feature enables the watchdog function, sets the count-down period of the timer, and reloads the time-out value periodically to keep it from resetting the system. If the count-down value of the timer is not reloaded, the watchdog will reset the system hardware after the counter reaches to zero.

For a detailed programming sample, please refer to the sample code provide with the CD-ROM located at
X:\cPCI\cPCI-6841\WDT\WDT.CPP

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5.3 Intel Preboot Execution Environment (PXE)

The cPCI-6841 series supports Intel® Preboot Execution Environment (PXE), which provides the capability to boot up or execute an OS installation through an Ethernet connection. There should be a DHCP server in the network with one or more servers running PXE and MTFTP services. It could be a Windows NT or Windows 2000 server running DHCP, PXE and MTFTP service or a dedicated DHCP server with one or more additional servers running PXE and MTFTP service. This section describes the major items required for building a network environment with PXE support.

1. Setup a DHCP server with PXE tag configuration
2. Install the PXE and MTFTP services
3. Make boot image file on PXE server (that is the boot server)
4. Enable the PXE boot function on the client

For further details, please refer to pdkrel30.pdf under the directory X:\Utility\PXE_PDK.

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Appendix

Serial Console User's Guide

1. Introduction

Most industrial implementations do not use a monitor or a keyboard to interface between the user and the computer, instead connecting through a network or direct cable. ADLINK provides a function for users to obtain Power-On Self Test (POST) messages and execute commands using serial-port access. This function is provided by Phoenix Technologies Ltd. (a.k.a. Award BIOS) and is integrated into the BIOS of ADLINK's CPU boards.OS) and integrated into the BIOS of ADLINK's CPU boards.

Note: Serial Console is a character-based terminal application. It supports either VT100 or ANSI terminals. It does not support graphics or graphical user interfaces. Serial Console is referred to as Award Preboot Agent by Phoenix Technologies Ltd.

2. Equipment Needed

To use Serial Console, the following items are required:.

- A server with the Award Preboot Agent BIOS
- A client with a VT100 or ANSI terminal utility or application
- A direct connection cable

The client obtains POST information from the server through a direct connection cable. The server must have Award Preboot Agent BIOS to support Serial Console. The required setup is explained below.

To support Serial Console, a VT100 or ANSI compatibility terminal utility or application is required. It needs to be executed on the client to receive data from the server. In this guide, Microsoft's HyperTerminal application, which is included with Windows, will be used as the terminal console. Detailed settings are described below in Section 5.4.

A null-modem cable is used as to connect the server and client serial ports. Pin routing of a null-modem connection is as shown:

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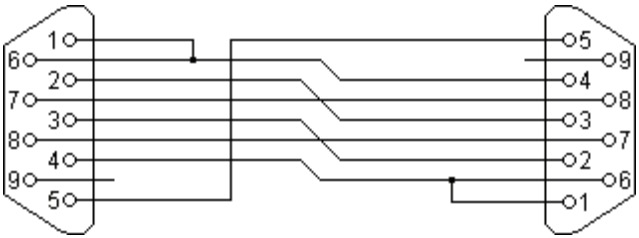


Figure 6-1: Null Modem Connection

3. Seting up the Server

The server used in this guide is a CPU board where the Award Preboot Agent is integrated into the BIOS. Use the BIOS setup utility to setup the Serial Console. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key allows you to enter the BIOS setup utility. Serial Console setup items are found in the “Advanced BIOS Features” (Award Modular 6.0) or “BIOS FEATURES SETUP” (Award Modular 4.51) page. They are listed as follows:

Console Redirection

This field allows you to enable or disable the Serial Console function. If Enabled is selected, you must make sure that the null modem cable connecting the two computers and the character-based terminal application are prepared.

Baud Rate

This is an important field that determines the communication rate between the client and server. Baud rate selections are 9600, 19200, 38400, 57600 and 115200.

Note: Baud rate settings between client and server must be the same. If they are different, the error message “Award Preboot Agent Installation Failed” will be displayed when the BIOS attempts to make a connection between server and client.

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Agent Connect Via

This field is un-selectable. Only one connection mode is supported: NULL. NULL means the connection cable is of null modem type.

Agent wait time (min)

This option selects the amount of time (in minutes) to wait for a successful connection. If the selected time elapses, the Serial console times out and will not be supported by the server.

Agent after boot

This field enables or disables accepting text-based applications (such as DOS) after the POST. If disabled, it will not send any messages to client computers after booting to the OS. If enabled, the user may execute commands from the client.

A boot message will be displayed after the BIOS attempts to establish a connection between server and client:

- "Award Preboot Agent Installation Successful"

When this message is displayed, POST messages are sent to the client and indicates that Serial Console mode has been successfully initiated.

- "Award Preboot Agent Installation Failed"

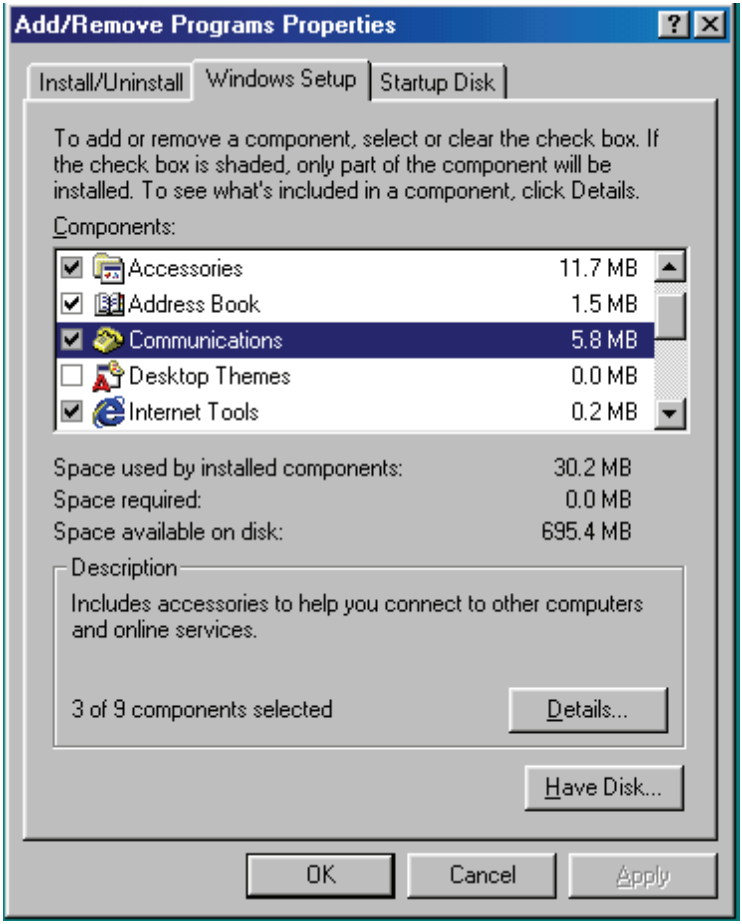
If this message is shown, there is an issue with the connection. To resolve this issue check the Serial Console configuration of the server as described above, and ensure that the settings of the terminal application of the client are configured accordingly.

4. How to Use the Serial Console

HyperTerminal is a console utility included with Microsoft Windows operating systems, such as Windows 98, NT, 2000. Other console utilities can also be used to achieve remote control functionality.

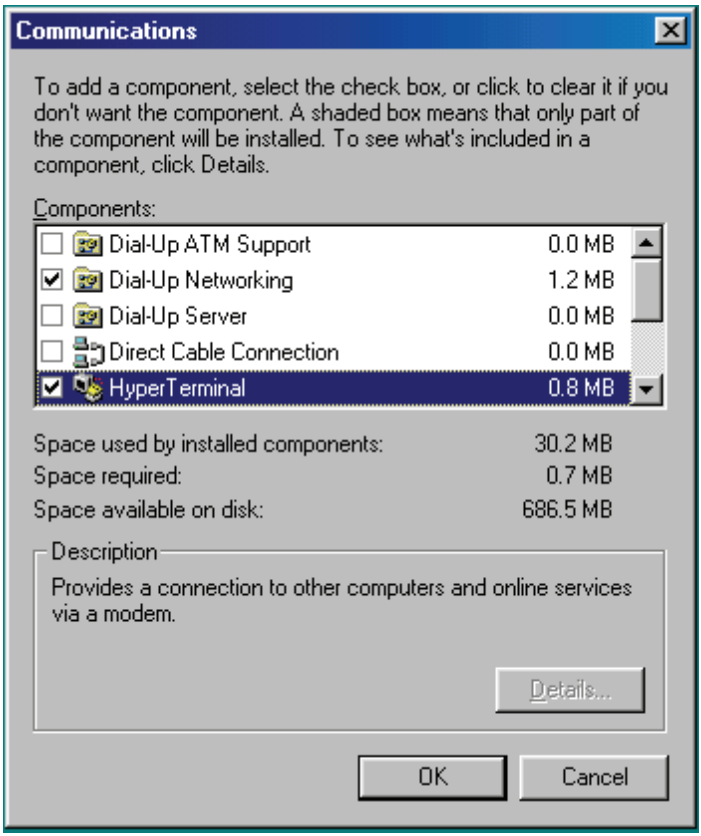
Note: The HyperTerminal version used to illustrate these instructions is that of Windows 98 SE.

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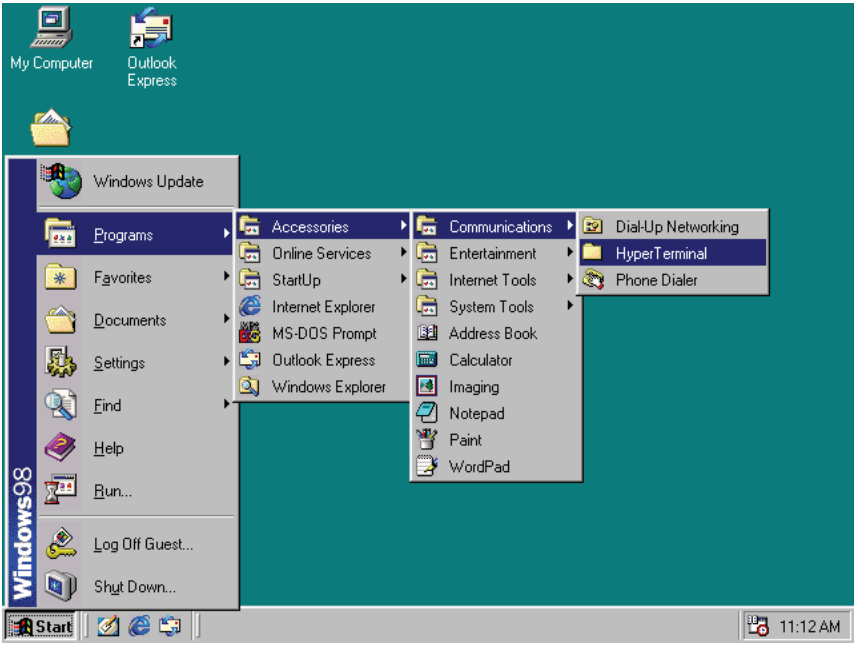
If your system does not have HyperTerminal installed, please use [Add/Remove Program Properties] in Control Panel to add it.

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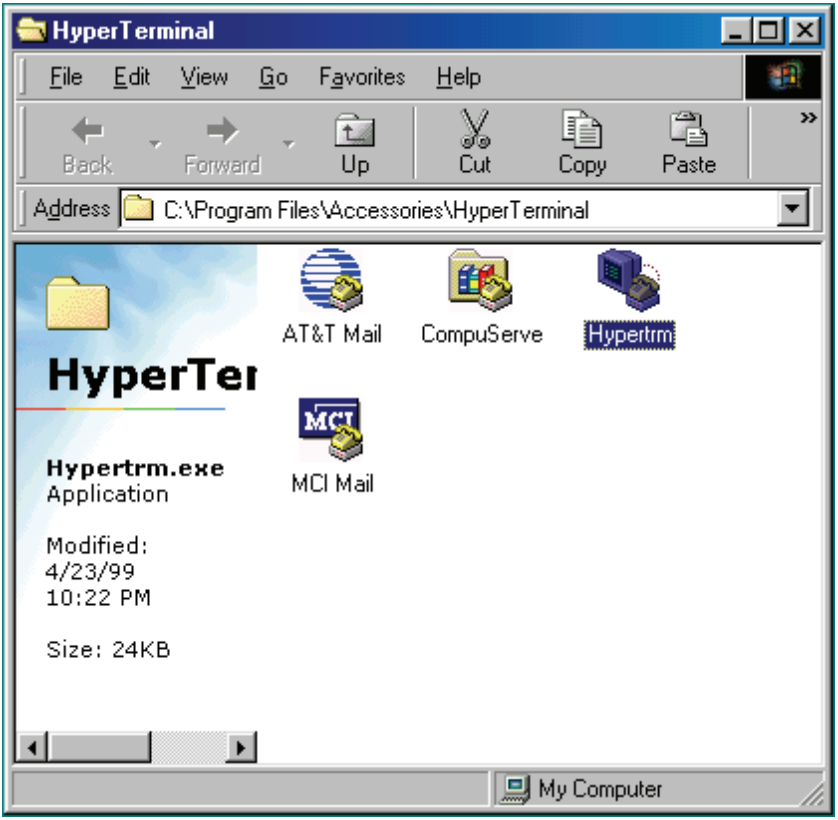
Make sure that HyperTerminal is checked.

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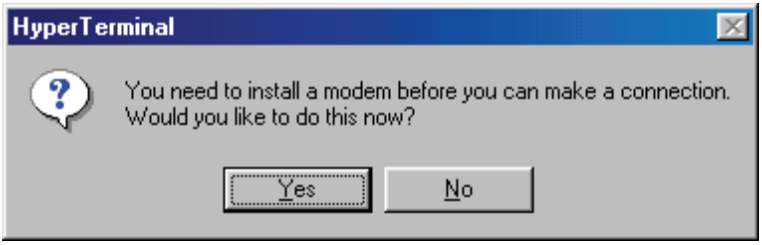
Select HyperTerminal.

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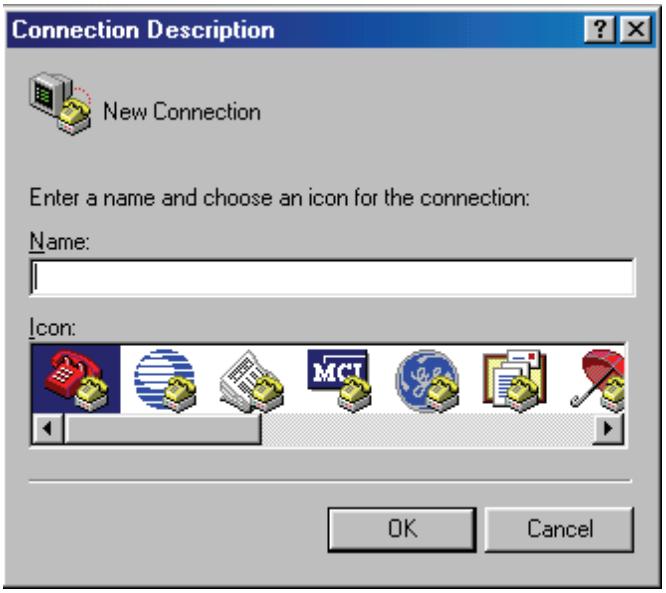


Run *Hypertrm* by double-clicking on the icon.

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When executing HyperTerminal for the first time, you will be asked to install a modem before running HyperTerminal. Select “No”. Then, you will be asked to enter some configuration settings for your local area.



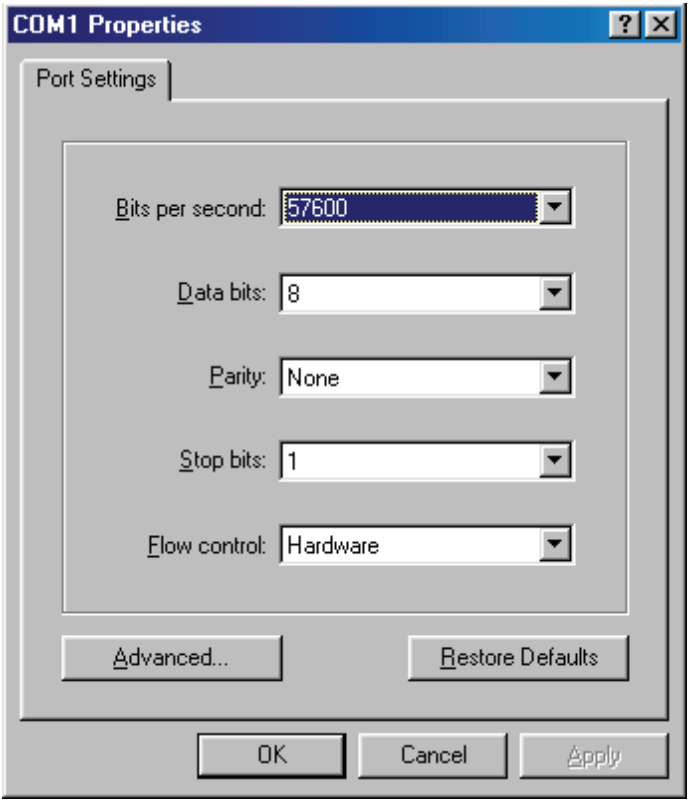
After configuring the basic settings, HyperTerminal will need to build a connection node. Enter a name you want to use and choose an icon.

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Once you build a connection node, select the serial port that will be used to connect to the server.

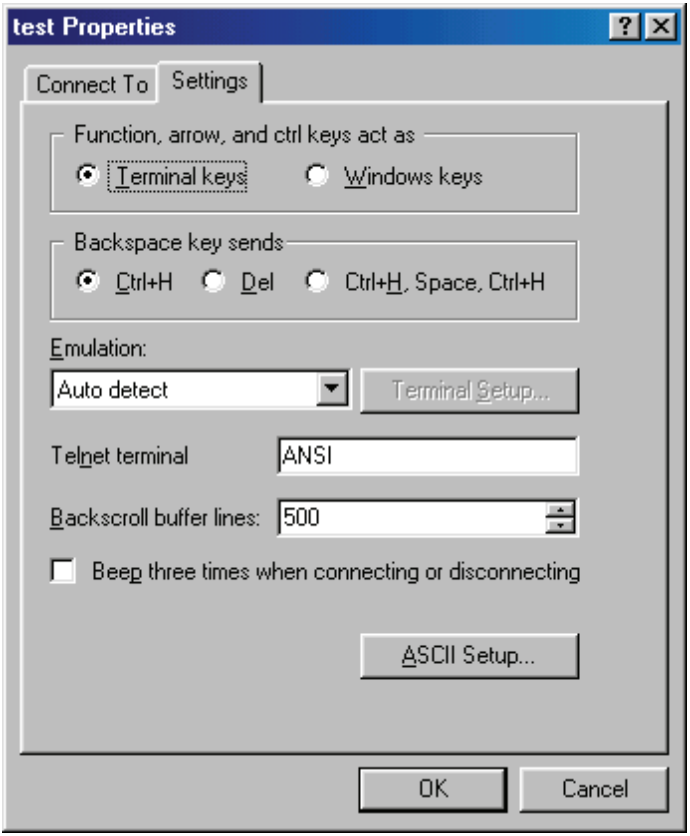
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On the properties page of the chosen serial port, the Bits per second setting must be the same as the baud rate setting of the server.

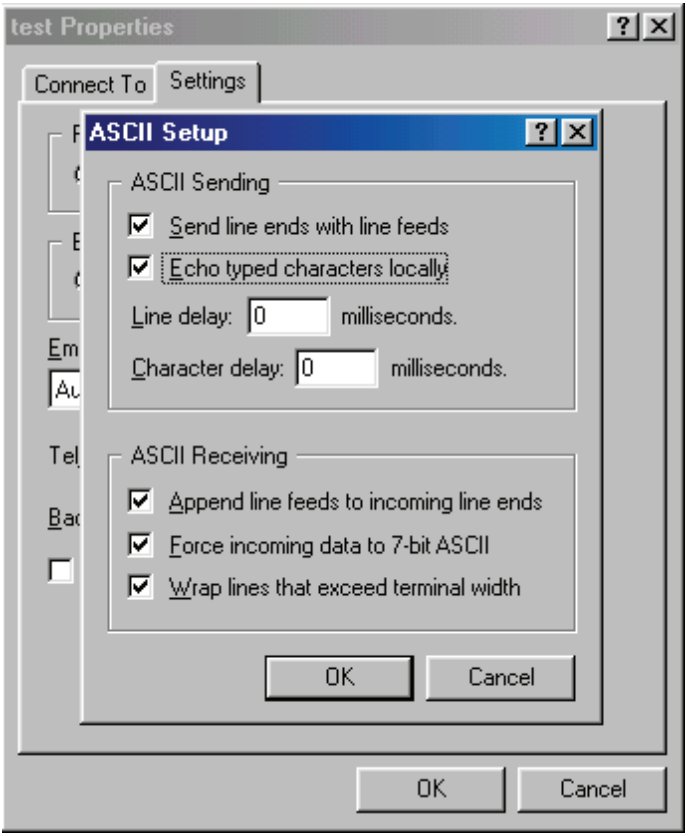
Before using HyperTerminal to connect to the server, some properties of the console must first be set. Select *File* --> *Properties*.

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Check that the Telnet terminal mode is set to ANSI and select ASCII Setup.

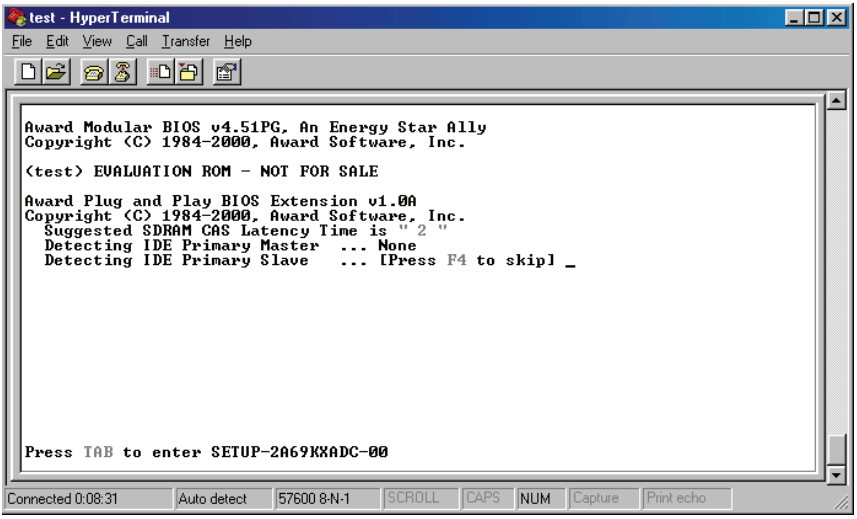
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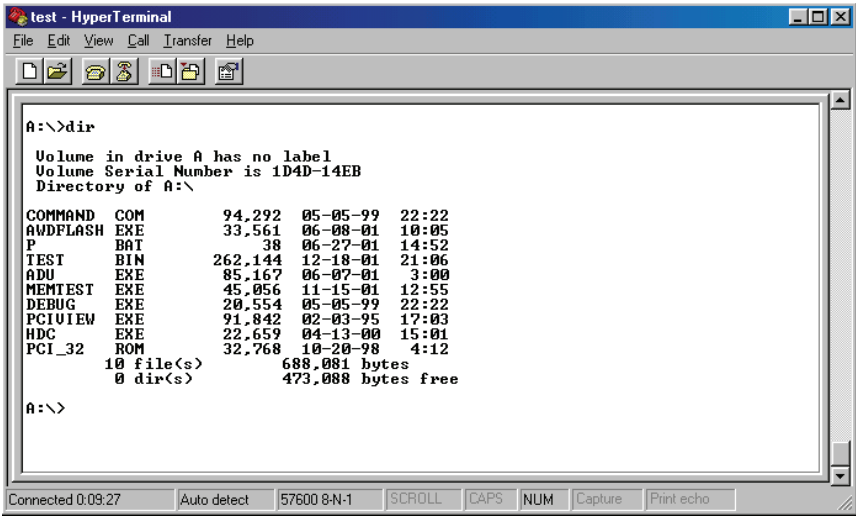


To echo the data that the client sends, select all items on the ASCII Setup page.

After HyperTerminal is setup and the connection cable is ready, power on the server. POST messages from server will be sent to the HyperTerminal Console as follows.

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After the server computer boots into the OS, execute commands through the HyperTerminal console as shown.

Note: Some keys, (i.e. DEL, ESC, Page Up, Page Down, Up Arrow, Down Arrow, Left Arrow, Right Arrow) may not be recognized by the server BIOS through the HyperTerminal

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console. Use the following sequences to perform such actions:

Function Key	Key Sequence	Function Key	Key Sequence
HOME	ESC [1 ~	PG UP	ESC [5 ~
INS	ESC [2 ~	PG DOWN	ESC [6 ~
DEL	ESC [3 ~	UP ARROW	ESC [A
END	ESC [4 ~	DOWN ARROW	ESC [B
ESC	ESC ESC	RIGHT ARROW	ESC [C
		LEFT ARROW	ESC [D

Table 6-1: Key Translation Sequences

Function	Key Sequence
Reboot system	ESC C

Table 6-2: Special Commands

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Thank you for choosing ADLINK. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully.

1. Before using ADLINK's products please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form which can be downloaded from: http://rma.adlinktech.com/policy/.
2. All ADLINK products come with a limited two-year warranty, one year for products bought in China:
   - The warranty period starts on the day the product is shipped from ADLINK's factory.
   - Peripherals and third-party products not manufactured by ADLINK will be covered by the original manufacturers' warranty.
   - For products containing storage devices (hard drives, flash cards, etc.), please back up your data before sending them for repair. ADLINK is not responsible for any loss of data.
   - Please ensure the use of properly licensed software with our systems. ADLINK does not condone the use of pirated software and will not service systems using such software. ADLINK will not be held legally responsible for products shipped with unlicensed software installed by the user.
   - For general repairs, please do not include peripheral accessories. If peripherals need to be included, be certain to specify which items you sent on the RMA Request & Confirmation Form. ADLINK is not responsible for items not listed on the RMA Request & Confirmation Form.

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3. Our repair service is not covered by ADLINK's guarantee in the following situations:
   - Damage caused by not following instructions in the User's Manual.
   - Damage caused by carelessness on the user's part during product transportation.
   - Damage caused by fire, earthquakes, floods, lightening, pollution, other acts of God, and/or incorrect usage of voltage transformers.
   - Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
   - Damage caused by leakage of battery fluid during or after change of batteries by customer/user.
   - Damage from improper repair by unauthorized ADLINK technicians.
   - Products with altered and/or damaged serial numbers are not entitled to our service.
   - This warranty is not transferable or extendible.
   - Other categories not protected under our warranty.
4. Customers are responsible for shipping costs to transport damaged products to our company or sales office.
5. To ensure the speed and quality of product repair, please download an RMA application form from our company website: http://rma.adlinktech.com/policy. Damaged products with attached RMA forms receive priority.

If you have any further questions, please email our FAE staff: service@adlinktech.com.

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