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CT7

Pentium PC/AT Compatible 6U CompactPCI®
Single Board Computer with HotSwap

Hardware User's Manual
Revision 1.3.2

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CT7 Hardware User's Manual

This manual applies to the CT7 Pentium PC/AT Compatible 6U CompactPCI® Single Board Computer with HotSwap revision 1.0 and above, until superseded.

Revision	Date	Chapter	Comments
1.0	05-05-2000		Initial release.
1.0	20-03-2001		Second release. All chapters revised.
1.1	20-10-2001		Draft edition with extensive layout changes.
1.2	09-04-2002		Third release (final). All chapters revised.
1.3	04-06-2003		Updated U.S. Branch Address.
1.3.2	08-01-2004	7	Updated Placement Plan Drawings

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Welcome

The *CT7 CompactPCI Single Board Computer* is a fully IBM-AT compatible stand-alone PC equipped with numerous functions and add-on features on a minimized board size. This technical manual is designed to provide information regarding the general use and application of the *CT7 CompactPCI Single Board Computer*, as well as detail the hardware design. Software methods and programming information are also provided.

Chapter 1 of his manual gives a brief overview over the functions, features and devices of the CT7. Chapter 2 and 3 illustrate unpacking and installation procedures. Chapter 4 describes all onboard and panel interfaces with pin assignments. Chapter 5 contains notes on system resources, chapter 6 lists details of software interfaces. Electrical and environmental specifications can be found in chapter 7.

A number of expansion and add-on products is available for the CT7. The ET7 extension module, the CTM10 and CT7-TM transition modules are described in appendices to this manual.

Please observe all safety instructions when handling SBS products as given in the unpacking and installation chapters.

The following documents also cover items relevant to the CT7 CompactPCI Single Board Computer. Both documents are included as files on the distribution CD-ROM.

- AMI-BIOS for CT7 User's and Programmer's Manual
- IPMI Board Management Support Hardware / Software Manual

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Typographic Conventions

The following conventions are used throughout this manual:

— The use of an “H” suffix before a number indicates hexadecimal (base sixteen) notation.
— The use of a “\” (backslash) suffix to a signal indicates an active low signal. The signal is either true when it is a logic zero level or the signal initiates actions on a high-to-low transition.
— Text in `Courier` font indicates a command entry or output from a SBS embedded PC product using the built-in character set.

Support, Service, and Warranty

The manufacturer grants the original purchaser of SBS products a warranty of 24 months from the date of delivery. For details regarding this warranty refer to Terms & Conditions of the initial sale.

Please see chapter “Support, Service, and Warranty Information” on page 91 for further details on repairs and product support.

For support on the web and product information, visit our website at

http://www.sbs.com

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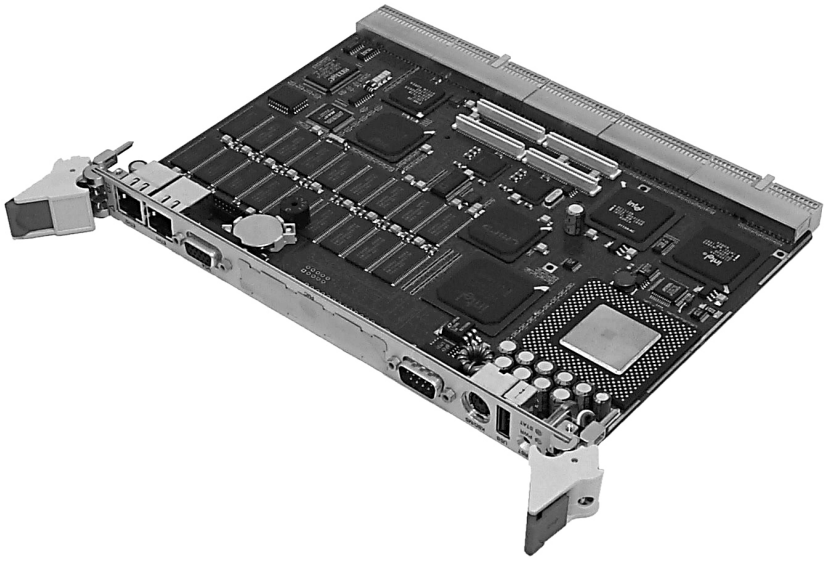
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CHAPTER 1 Introduction



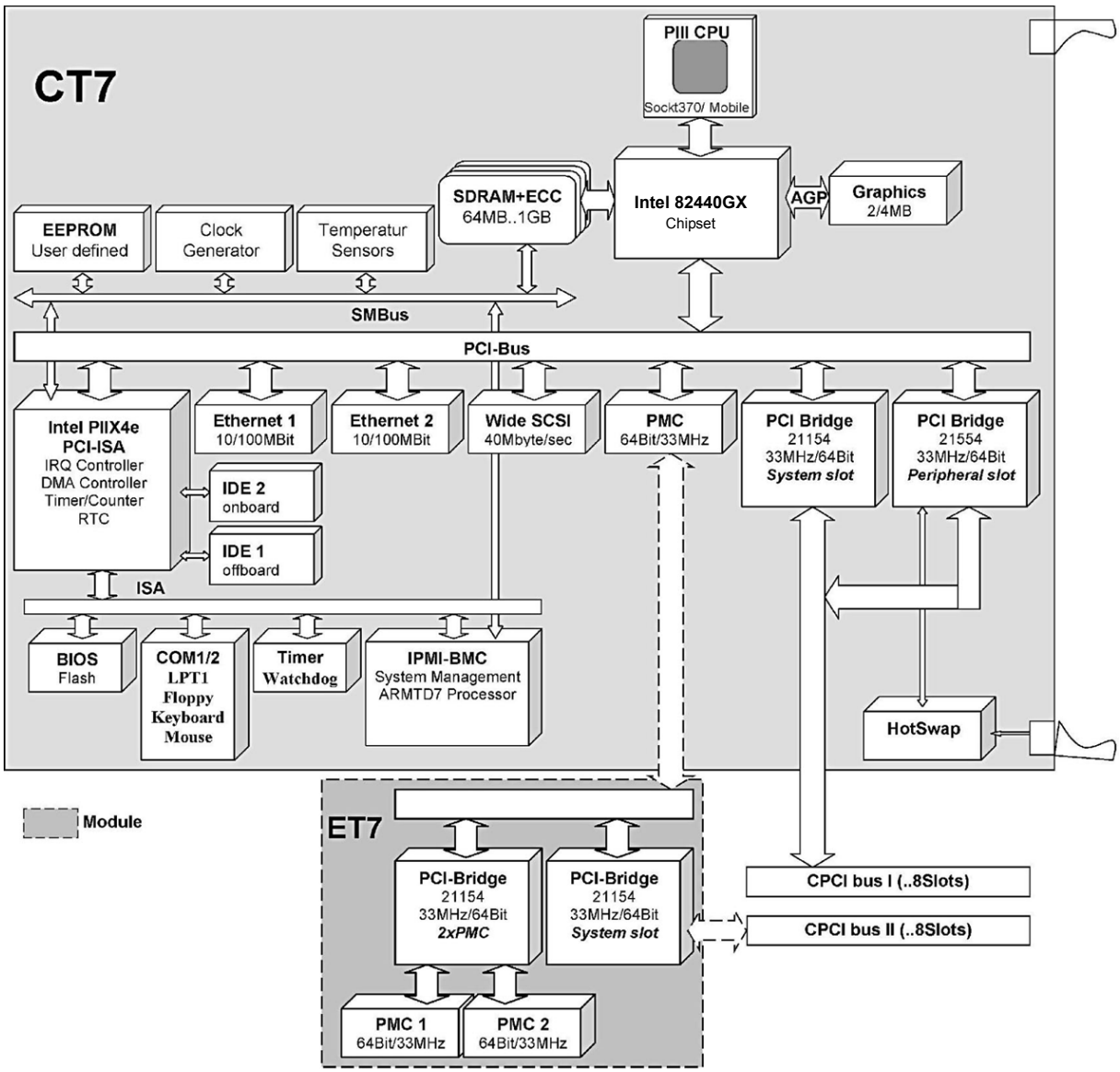
Chapter Scope

This chapter describes features, capabilities and compatibilities of the CT7 CompactPCI Single Board Computer.

Board Design

The CT7 is a fully IBM-AT compatible stand-alone PC. It is equipped with many functions a conventional Personal Computer can only offer with several add-on cards. Extension boards can be connected via the CPCI interface. The minimized board size and the large number of interfaces and functions allow the CT7 to be used in many applications. See the following block diagram for the boards design.

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Please note that the ET7 is an optional extension board. It is sold separately and not required for basic operations of the CT7.

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Design Features

The CT7 CompactPCI Single Board Computer features:

Microprocessor

Intel® Celeron™ processor 566 MHz
Intel® Pentium III processor 700, 850 MHz, 1 GHz
Intel® Mobile Pentium III processor 500, 700 MHz

Cache RAM

Processor	level 1	level 2
Celeron	32 KB	128 KB, full speed
PIII	32 KB	256 KB, full speed
Mobile Celeron	32 KB	128 KB, full speed
Mobile PIII	32 KB	256 KB, full speed

DRAM

DRAM 64 MB to 1 GB SDRAM with ECC,
running at 66/100MHz.

Chipset

Intel 82440GX with 82371EB (PIIX4e) ISA bridge.

Flash BIOS

Easy updating, in-system programmable
AMI BIOS
LSI Logic SCSI BIOS
Chips & Technology VGA BIOS
Intel Ethernet BOOT module

Hard/Flash Disk

Onboard mountable 2,5” IDE hard disk or FlashDrive.

EEPROM

Serial EEPROM 512 Bytes, System information.

CMOS RAM

114 byte non-volatile RTC, MC146818 compatible RTC
with onboard Lithium battery.

Keyboard/Mouse

IBM PC/AT compatible keyboard controller
with PS/2 style connector.

USB

Two high-speed 12 Mbit/sec USB ports.

Watchdog

Watchdog activates reset under software control.

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High Resolution Timer

User programmable timer, allows “Real Time Functions” with Windows 3.11, Windows 95 and Windows NT.

LCD/VGA

AGP VGA C&T 69000 (2MB) or 69030 (4MB) with 64-bit Windows accelerator and LCD flat panel interface. Resolution on CRT up to 1280x1024/8Bit (69000) or 1600x1280/16Bit (69030). Support color and monochrome TFT or STN panel with up to 1024x768 resolution and max. 24-bit interfaces.

Fast Ethernet

Two high speed PCIbus Ethernet controller (Intel 82559ER) with 10BaseT and 100BaseTX interface and integrated FIFO buffer.

SCSI-2

PCI Ultra Wide SCSI-2 controller (SYM53C875) with up to 40 Mbytes/s transfer rate.

Floppy

Supported formats: 3.5 inch, 720 Kbyte - 1.44 Mbyte.

EIDE/ATAPI

PCI EIDE/ATAPI interface with two IDE controller (primary IDE offboard and secondary IDE onboard). Transfer rate with up to 33 MB/s, for two external devices and one onboard 2,5” hard/flash disk.

Serial I/O

Two async. 16550 compatible channels with 16 byte FIFO, Transfer rates up to 115.2 Kbaud.

Parallel I/O

Fully bidirectional IEEE 1284 enhanced parallel port support ECP and EPP modes.

PMC slot

64Bit/33MHz PCI mezzanine connector for standard PMC with front and rear IO. IO signals available at the rear connector J3 (pinout compliant with CPCI spec PICMG 2.3 for single PMC).

PMC extension

Two 64Bit/33MHz PCI mezzanine connector for standard PMC with front and rear IO are available on the optional extension board. I/O signals available at the rear connector J3, J4 (pinout compliant with CPCI spec PICMG 2.3 for dual PMC).

CPCI System slot

Up to 7 slot 64Bit CPCI/33MHz with 21154 bridge. Up to 14 slots 64Bit/33MHz CPCI with optional extension board. Standard backplanes can be used.

CPCI I/O Slot

CT7 works as peripheral board with Hot Swap functionality.

IPMI

Support for *I*ntelligent *P*eripheral *M*anagement *I*nterface.

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Temperature Sensor

Shows temperature of CPU-heat sink and onboard. The sensors are software readable in 1°C increments from -55 to +125°C.

Frontpanel I/O

2 x Ethernet, VGA, PMCIO, COM1, KB/MS, USB1, Reset, 3xLED (blue: HotSwap; green, red: user definable).

Backpanel I/O

VGA, LCD, SCSI, IDE (Master/Slave), FDC, COM1-2, LPT1, USB1-2, PM-CIO, KB, MS, speaker, reset, watchdog, ext. Battery, SMBus, IPMB, GPIO[0...1], ICMB, 2x Ethernet. Transition modules for 1:1 PC compatible connectors available.

Power supply

+5V	board supply
+12V	PMC and HotSwap controller supply
-12V	optional, if needed on PMC

Approval

UL approved: E214940

H110 Backplanes

When using the CT7 in backplanes providing H110 functionality, the CPCI-J4 connector shall not be assembled. The rear IO for the LCD connection will not be available then.

Styles available

	C-Style	I-Style
Front panel	X	X
Extended temp.		X
Parts soldered	X	X

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CHAPTER 2

Unpacking and Inspection

Chapter Scope

This chapter covers the suggested inspection and preparation considerations and background information necessary prior to using the CT7. Unpacking, initial inspection, and first-time operation of the CT7 are covered. Following the procedures given in the chapter is recommended, since they will verify proper operation after shipping and before the product is integrated into your system.

ESD

Electrostatic Discharge Notice

The discharge of static electricity, known as **E**lectro **S**tatic **D**ischarge or ESD, is a major cause of electronic component failure. The CT7 has been packed in a static-safe bag which protects the board from ESD while the board is in the bag. Before removing the CT7 or any other electronic product from its static-safe bag, be prepared to handle it in a static-safe environment.



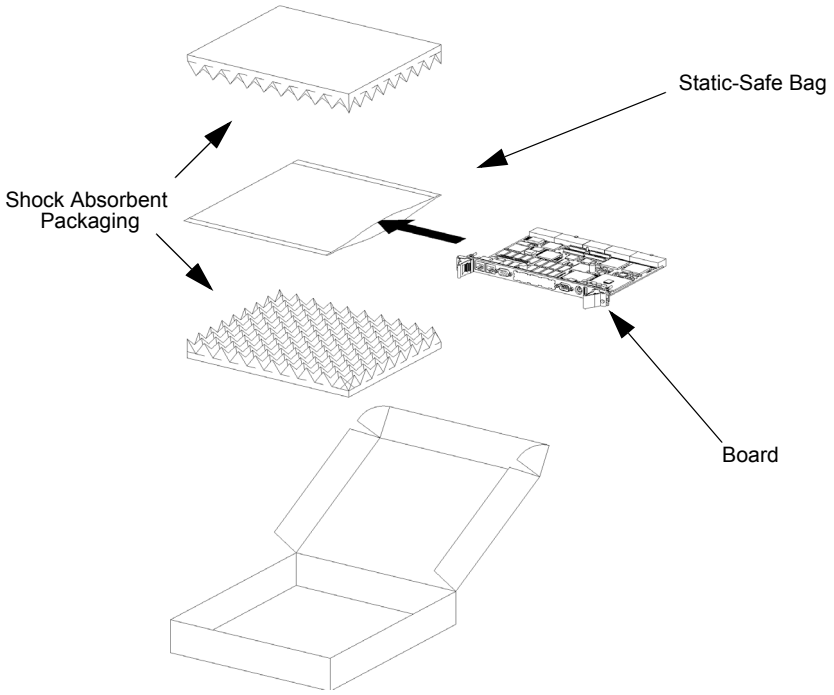
ATTENTION
Static Sensitive Devices
Handle only at Static Safe Work Stations

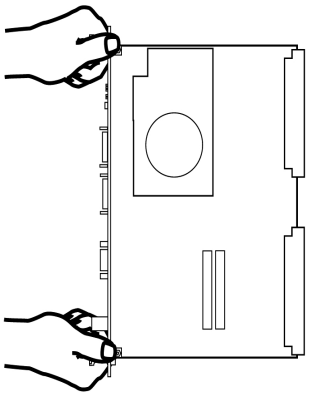
You should wear a properly-functioning anti static strap and ensure you are fully grounded. Any surface upon which you place the unprotected CT7 should be static-safe, usually facilitated by the use of anti static mats. From the time the board is removed from the anti static bag until it is in the card cage and functioning properly, extreme care should be taken to avoid “zapping” the board with ESD. You should be aware that you could “zap” the board without you knowing it; a small discharge, imperceptible to the eye and touch, can often be enough to damage electronic components. Extra caution should be taken in cold and dry weather when static easily builds up.

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Unpacking and Handling

Although the CT7 is carefully packaged against the rigors of shipping, it is still possible that shipping damages can occur. Careful inspection of the shipping carton should reveal some information about how the package was handled by the shipping service. If evidence of damage or rough handling is found, you should notify the shipping service and SBS Technologies as soon as possible.





Retain all packing material in case of future need.

Only after ensuring that both you and the surrounding area are protected from ESD, carefully remove the CT7 from the shipping carton by grasping it by the front panel and the connectors. Place the board, in its anti static bag, flat down on a suitable surface. You may then remove the board from the anti static bag by tearing the ESD warning labels.

Proper handling of the CT7 is critical to ensure proper operation and long-term reliability. When unpacking the board, and whenever handling it thereafter, be sure to hold the board by the front panel or the card ejectors as shown in the drawing on the left. Do not hold the board by the circuit card edges, the heat sink, or the connectors.

Initial Inspection

After unpacking the CT7, you should inspect it for visible damage that could have occurred during shipping or unpacking. If damage is observed (usually in the form of bent component leads or loose socketed components), contact SBS Technologies for additional instructions. Depending on the severity of the damage, it may need to be returned to the factory for repair. **DO NOT apply power to the board if it has visible damage.** Doing so may cause further, possibly irreparable damage, as well as introduce a fire or shock hazard. Since the CT7 incorporates a number of socketed components, including the CPU, memory, etc., these should be inspected to make sure they are seated fully in their sockets.

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Delivery Volume

Please check that the delivered package contains the following items:

Qty.	Item	Purpose	
1	CT7	CompactPCI Single Board Computer	
1	Media	CD-ROM or floppy disks with driver software and manuals in Adobe Acrobat (PDF) format:	
		ct7.pdf	CT7 Technical Manual
		ami_ct7.pdf	AMI BIOS & Programmer's Manual
		ipmi.pdf	IPMI CT7-CE7 Programmer's Manual

The manual files are also available through the World Wide Web from our Web-Server:

http://www.sbs.com

Available Options and Accessories

The following table lists accessories (options) which are available for the CT7:

Qty.	Item	Purpose
1	ZKAAPS2SPLIT	Front panel Y-cable for keyboard and mouse
1	ET7	Extension board, 6U (233 x 160 x 40 mm)
1	CTM10	Transition module, 4U x 4HE/HP
1	CT7-TM	Rear I/O transition module, 6U x 80mm

Please contact the sales department or your sales representative for latest information on options and accessories.

Accessories are subject to change without notice.

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CHAPTER 3 Installation

Chapter Scope

This chapter covers the installation of the CT7 CompactPCI Single Board Computer in a CompactPCI backplane and initial power-on operations.

Advisories

Please observe all safety procedures to avoid damaging system and protect operators and users.

Unpacking and Handling

Please read the manual carefully before unpacking the module or fitting the device into your system. Also adhere to the following:

— Observe all precautions for electrostatic sensitive modules.
— If the product contains batteries, please do not place the board on conductive surfaces, anti-static plastic, or sponge, which can cause shots and lead to battery or board trace damage.
— Please do not exceed the specified operational temperatures. Note that batteries and storage devices might also have temperature restrictions.
— Keep all original packaging material for future storage or warranty shipments of the board.

ESD



Electrostatic Discharge (ESD) is a major cause of electronic component failure. The CT7 has been packed in a static-safe bag which protects the board from ESD while the board is in the bag. From the time the board is removed from the anti static bag until it is properly mounted in a backplane, extreme care should be taken to avoid damaging board through electrostatic discharges. See page 14 for details on how to prevent “zapping” the board with ESD.

General Advisories.

Before installing or removing any board, please ensure that the system power and external supplies have been turned off.

Check that jumpers and piggybacks are correctly configured for your application.

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Mount the board, piggyback, or transition module very carefully. See also sections on additional advisories below.

Do not restore power until you are sure that all modules are fitted correctly and all connections have been made properly.

Advisories for CompactPCI products

Mount the CPU board carefully on the CPCIbus slot. Note that on some boards connectors are used for I/O purposes which must not be inserted into a CPCI-bus backplane. A transition module must be used instead.

Batteries

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by SBS Technologies.

Dispose of used batteries according to instructions of SBS Technologies and applicable local regulations.

Minimum System Requirements

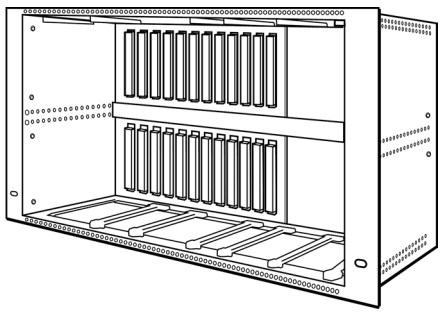
As shipped, the CT7 has been thoroughly tested, and is nearly ready for use in your system. In order to verify CT7 operation for the first time, it is suggested that you only configure a minimal system. It is not necessary to have disk drives, a Flash disk or other accessories connected in order to perform the CT7 confidence tests.

Because the CT7 is available in several options the description in this chapter is related to the standard configuration.See the following table for standard and optional configurations and their influence on initial operation:

Configuration	VGA	LAN	System / non-system	LCD interface	IPMI
Standard	yes	yes	both	yes	no
Others	option	option	both or non-sys	option	option

The following items are required to start the CT7 in a standard configuration:

Backplane and Power Supply. You will need a standard CompactPCI backplane wired into a regulated power supply capable of providing stable low noise +5V and +12V sources. Make sure that the supply is capable of meeting the total power requirements of the CT7. Please refer to chapter “Specifications” on page 48 for details.



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The CT7 features Full Hot Swap capabilities according to the PCI Hot Plug specification. This allows orderly insertion and extraction of the board from the system host (backplane) without having to power down the system. Please note that this feature requires that hot swap functions are also available on the backplane. See chapter “Hot Swap” on page 44 for details.

Initially, you may plug the CT7 into your 6U system slot of your CPCI system. Optionally, when used as an intelligent peripheral board, the CT7 can also be used in a non-system slot. In case that the CT7 is used in a non-system slot you have to have an additional CPU board in the system slot for providing system clock, arbiter function and more. Please make sure that you do not have the power supply turned ON when the CT7 is plugged into your backplane.

Keyboard and Mouse. You should have a compatible keyboard for initial system operation. Depending on your application, this keyboard may be a standard full-travel keyboard, or one which utilizes membrane switches for harsh environments. The miniature DIN keyboard connector is located on the front panel and is directly compatible with existing compliant keyboards. If your keyboard has the normal IBM PC-type keyboard connector you will need to use a cable adapter. This cable adapter is not delivered by SBS, but available on the shelf.

The connector is defined for both keyboard and mouse. SBS delivers a split adapter cable for keyboard and mouse, which has to be ordered separately. Plug this adapter cable ZKAAPS2SPLIT (Y form) into the keyed PS2 connector on the front panel, then plug the keyboard and mouse into the adapter. If the adapter is not used, only a keyboard can be connected.



Plugging and unplugging a PS/2 keyboard or mouse while power is applied is not recommended and can cause software failure or damage to the PS/2 device and/or on-board circuitry.

Video Monitor. Any VGA-compatible video monitor can be used initially for display output. The CT7 does not offer front access to the video, but it comes out as 10-pins on the rear I/O side, the CPCI connector J5. In order to get access to these pins it is necessary to use a transition module. SBS offers two of them.

Installation

The CT7-TM is a 6U x 80mm rear I/O module which has to be plugged into the CT7 with the backplane between. This transition module has a video connector which is fully compatible with the VGA standard connector and pinout. Plug your video monitor into this connector. Make sure that your selected chassis supports this type of rear I/O transition module.

The transition module CTM10 has a 10-pin header (P4300) for video. This module allows access to the I/O signals only within the chassis. For video access you have to manufacture a connector cable consisting of a 10-pin ribbon with a 10-pin female connector on one side and a 15-pin female video connector on the other side.

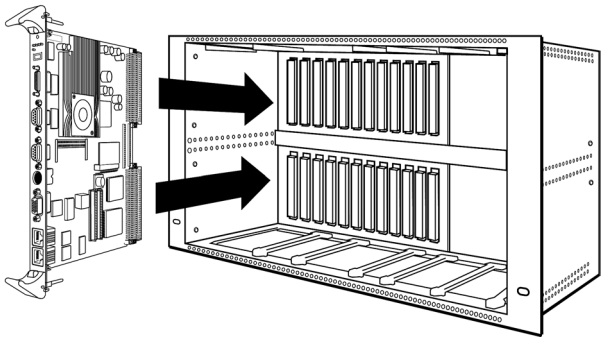
After making sure that you have installed the CT7 properly into your CPCI backplane, apply power to your video monitor and then the CPCI supply. When the board is completely reset, the processor should begin executing initial BIOS-resident routines.

Note: Make sure that the card ejectors are closed and the Hot Swap LED (blue) is OFF.

Note: If the CT7 was ordered without video onboard, you can use an external video CompactPCI card or a video PMC module. Consult the technical de-

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scriptions of these boards for required voltage and power consumption in the system.



Please see chapter “Interfaces” on page 22 for details on onboard interfaces. The location of the CT7 interfaces is shown in section “IO-Diagram” on page 23.

Initial Power-On Operation

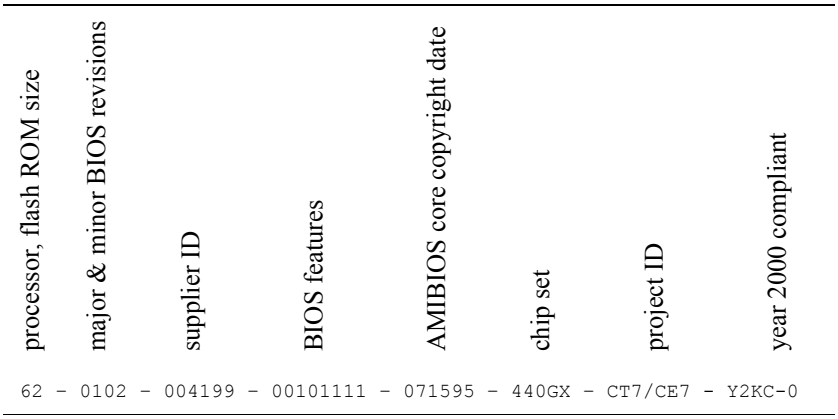
After a few seconds, the CT7 system BIOS banner will display on the and the red LED on the front will go ON and OFF.

If you have seen all the messages to this point, you can be confident that the board is running properly and is ready to be installed and setup for your application.

```
American
Megatrends     AMIBIOS © 1997 American Megatrends Inc.
SBS Technologies CT7
Release    Date
       .
       .
       .
       .
       .  Board specific messages
       .
       .
       .
       .
       .
       .
       .
       .
© American Megatrends Inc.
62 - 0102 - 004199 - 00101111 - 071595 - 440GX - CT7 - Y2KC-0
```


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Example/coding of an ID line:



You can stop the video output for proper reading the three information lines as described: Simply press the “0 / Enter” key during the start-up sequence. This key is located on the numeric keypad of your keyboard.

Entering the BIOS SETUP

To enter SETUP during the initial power-on sequence press the key DELETE during the boot up sequence. Also see the applicable message on the screen. It tells you when you can enter the BIOS by pressing the DELETE key.

Consult the “AMI BIOS & Programmer’s Manual” (file AMI_CT7.pdf) for further information on how to change settings and configurations.

If the board does not perform as described above, some damage may have occurred in shipping or the board is not installed or setup properly. Contact SBS technical support as described in chapter “Support, Service, and Warranty Information” on page 91 for further instructions.

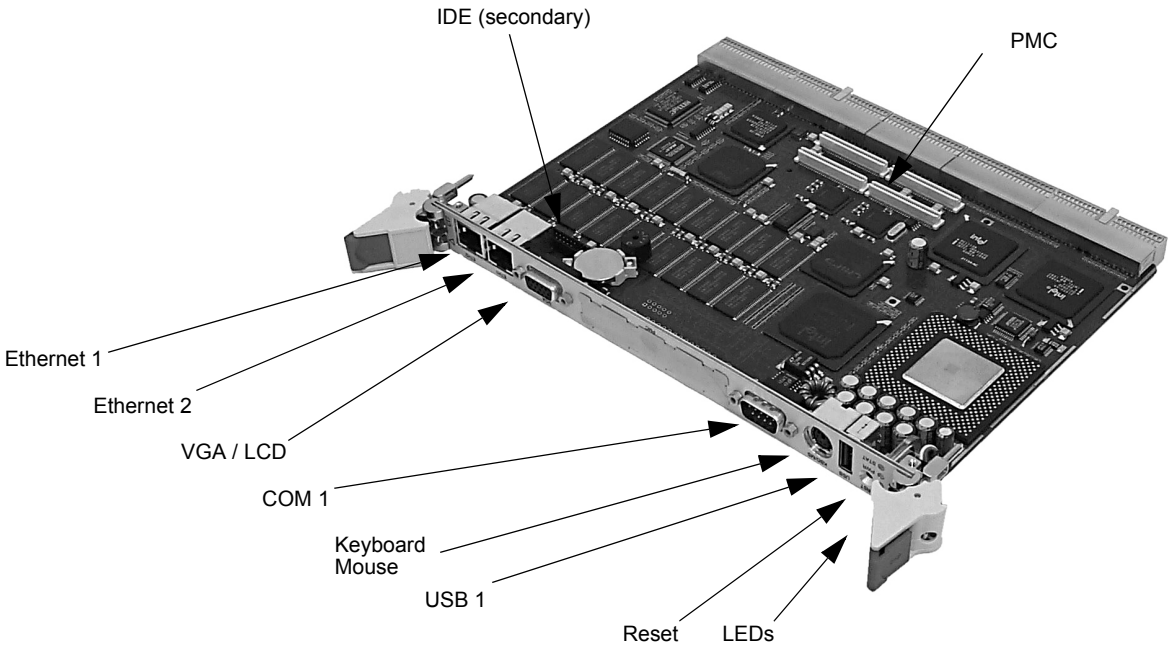
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CHAPTER 4 Interfaces

Chapter Scope

This chapter describes the interfaces of the CT7 CompactPCI Single Board Computer located solderside on the board and on the front panel. Each section on a particular interface includes a graphics illustration of the connector and a pin assignment table as well as notes on certain signal line characteristics, if necessary.

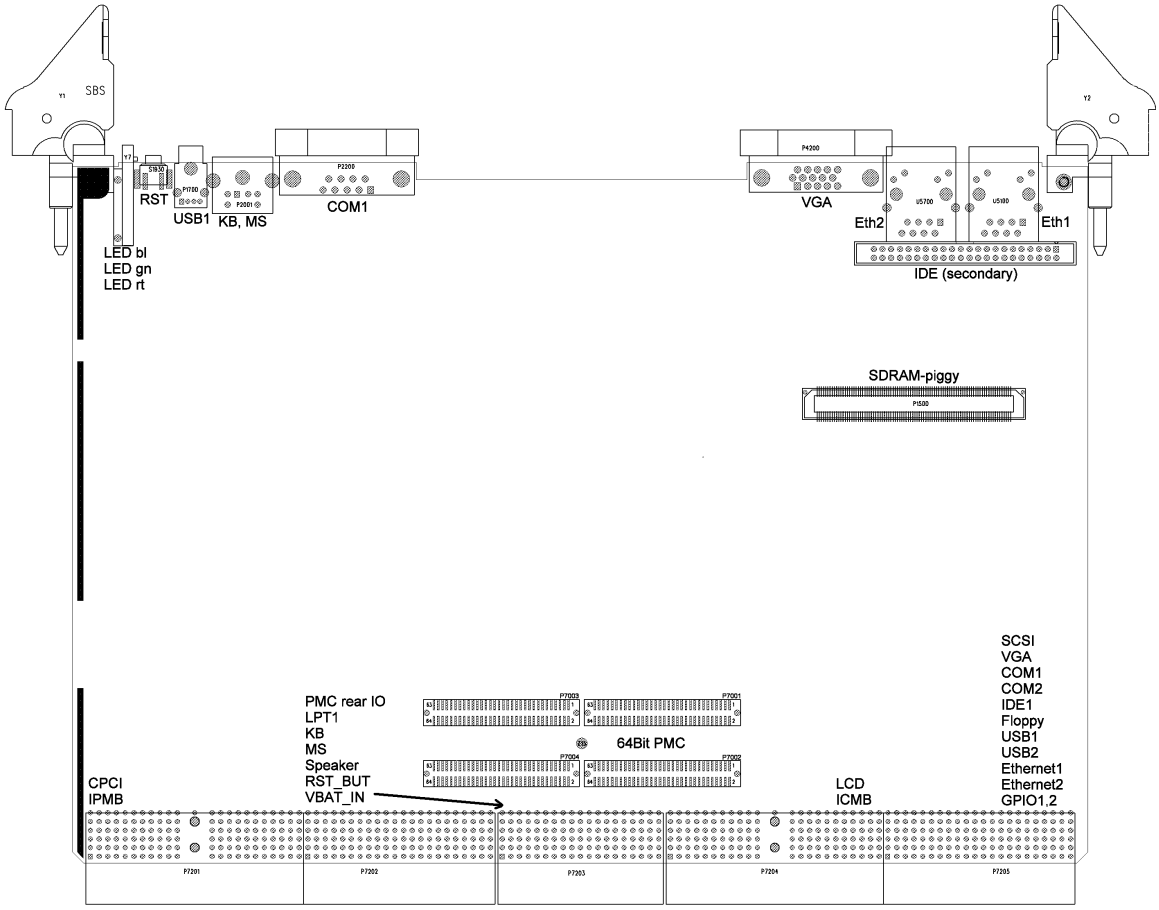
For interfaces of expansion and transition modules, please refer to the appropriate chapters found in the appendices to this manual.



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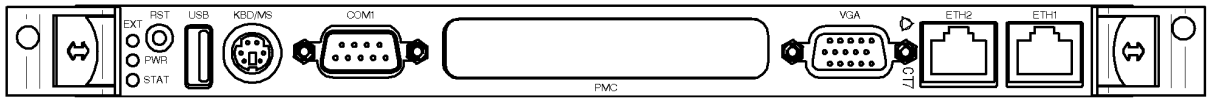
IO-Diagram

See the following drawing for positioning of onboard interfaces.

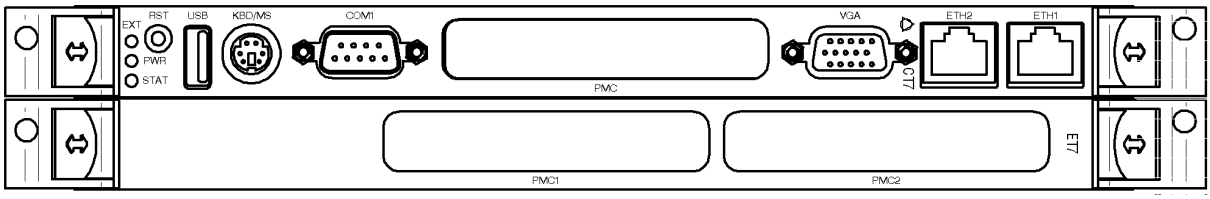


Front Panel Interfaces

Refer to the drawing for the location of interfaces on the front panel of the CT7 board.



This drawing indicates the location of interfaces on the front panel of the CT7 board with the ET7 extension board being mounted:



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CT7 Connectors

This chapter describes connector pinouts on the CT7. A pinout description for available extension and transition modules can be found in the corresponding appendix chapters. Apart from the ET7 extension board and the CTM10 transition module, a transition module with mechanical size compliant with IEEE 1101.11-1998 is also available (CT7-TM).

CPCI connector reference

The CPCI specification numbers the CPCI connectors from bottom to top J1, J2, J3, J4, and J5. The CPCI connectors on the CT7 are P7201, P7202, P7203, P7204, and P7205 respectively.

Signal groups	Determiner
floppy disk controller signals	\FD....
hard disk controller signals	HD.... and \HD....
Parallel port 1 signals	L1... and \L1....
COM1, COM2 signals	C1....., C2.....
SCSI signals	\S_... and S_....
VGA signals	VGA_
Universal Serial Bus	USB1-,USB1+ USB2-,USB2+
keyboard signals	KB_...
mouse signals	MS_...
LCD signals	LC_...
LAN signals	RJ... (with CT7R only)
SMB (I2C-Bus)	SMB_
IPMI	IPMI_
Misc. signals	\SPEAKER \WDG_REL \RST_BUT VBATIN
PMC IO Signals	PMC...
nc:	not connected

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CompactPCI bus Connector P7201 and P7202

This interface is used for connection to a standard CPCI backplane.

P7201	A	B	C	D	E	F
1	+5V	-12VIN	nc	+12VIN	+5V	GND
2	nc	+5V	nc	nc	nc	GND
3	\INTA	\INTB	\INTC	L+5V [a]	\INTD	GND
4	IPMI_PWR	\Healthy	VIO [b]	INTP	INTS	GND
5	nc	nc	\PCI_RST	GND	\GNT0	GND
6	\REQ0	GND	nc	PCICLK0	AD31	GND
7	AD30	AD29	AD28	GND	AD27	GND
8	AD26	GND	VIO [b]	AD25	AD24	GND
9	\C/BE3	IDSEL	AD23	GND	AD22	GND
10	AD21	GND	nc	AD20	AD19	GND
11	AD18	AD17	AD16	GND	\C/BE2	GND
12-14	KEY	KEY	KEY	KEY	KEY	KEY
15	nc	\FRAME	\IRDY	\BD_SEL	\TRDY	GND
16	\DEVSEL	GND	VIO [b]	\STOP	\LOCK	GND
17	nc	nc	nc	GND	\PERR	GND
18	\SERR	GND	nc	PAR	\C/BE1	GND
19	nc	AD15	AD14	GND	AD13	GND
20	AD12	GND	VIO [b]	AD11	AD10	GND
21	nc	AD09	AD08	nc	\C/BE0	GND
22	AD07	GND	nc	AD06	AD05	GND
23	nc	AD04	AD03	L+5V [a]	AD02	GND
24	AD01	+5V	VIO [b]	AD00	\ACK64	GND
25	+5V	\REQ64	\ENUM	nc	+5V	GND

a. +5V on long backplane pins for early power supply
b. The VIO signals are either 5V or 3.3V, depending on backplane

P7202	A	B	C	D	E	F
1	PCICLK1	GND	\REQ1	\GNT1	\REQ2	GND
2	PCICLK2	PCICLK3	\SYSEN	\GNT2	\REQ3	GND
3	PCICLK4	GND	\GNT3	\REQ4	\GNT4	GND
4	VIO	nc	\C/BE7	GND	\C/BE6	GND
5	\C/BE5	\64EN	VIO [a]	\C/BE4	PAR64	GND
6	AD63	AD62	AD61	GND	AD60	GND
7	AD59	GND	VIO [a]	AD58	AD57	GND
8	AD56	AD55	AD54	GND	AD53	GND
9	AD52	GND	VIO [a]	AD51	AD50	GND
10	AD49	AD48	AD47	GND	AD46	GND
11	AD45	GND	VIO [a]	AD44	AD43	GND
12	AD42	AD41	AD40	GND	AD39	GND
13	AD38	GND	VIO [a]	AD37	AD36	GND
14	AD35	AD34	AD33	GND	AD32	GND
15	nc	GND	\FAL	\REQ5	\GNT5	GND
16	nc	nc	\DEG	GND	nc	GND
17	nc	GND	\RST_BUT	\REQ6	\GNT6	GND
18	nc	nc	nc	GND	nc	GND
19	GND	GND	SMB_SDA	SMB_SCL	\ALERT	GND
20	PCICLK5	GND	nc	GND	nc	GND
21	PCICLK6	GND	nc	nc	nc	GND
22	GA4	GA3	GA2	GA1	GA0	GND

a. The VIO signals are either 5V or 3.3V, depending on backplane

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I/O Connector P7203, P7204, and P7205

The connector P7204 is not mounted, if the H110-Bus is used on the backplane.

For easy use a transition module is available from SBS Technologies to connect the I/O-Connectors with standard connectors.

P7203	A	B	C	D	E	F
1	+5V *	PMCIO_64	PMCIO_63	PMCIO_62	PMCIO_61	GND
2	PMCIO_60	PMCIO_59	PMCIO_58	PMCIO_57	PMCIO_56	GND
3	PMCIO_55	PMCIO_54	PMCIO_53	PMCIO_52	PMCIO_51	GND
4	PMCIO_50	PMCIO_49	PMCIO_48	PMCIO_47	PMCIO_46	GND
5	PMCIO_45	PMCIO_44	PMCIO_43	PMCIO_42	PMCIO_41	GND
6	PMCIO_40	PMCIO_39	PMCIO_38	PMCIO_37	PMCIO_36	GND
7	PMCIO_35	PMCIO_34	PMCIO_33	PMCIO_32	PMCIO_31	GND
8	PMCIO_30	PMCIO_29	PMCIO_28	PMCIO_27	PMCIO_26	GND
9	PMCIO_25	PMCIO_24	PMCIO_23	PMCIO_22	PMCIO_21	GND
10	PMCIO_20	PMCIO_19	PMCIO_18	PMCIO_17	PMCIO_16	GND
11	PMCIO_15	PMCIO_14	PMCIO_13	PMCIO_12	PMCIO_11	GND
12	PMCIO_10	PMCIO_9	PMCIO_8	PMCIO_7	PMCIO_6	GND
13	PMCIO_5	PMCIO_4	PMCIO_3	PMCIO_2	PMCIO_1	GND
14	VCC3	VCC3	VCC3	VCC	VCC	GND
15	L1_SLCT	L1_PE	L1_D7	L1_D6	KB_DATA	GND
16	L1_BUSY	\L1_ACK	L1_D5	L1_D4	KB_CLK	GND
17	\L1_SLIN	\L1_INIT	L1_D3	L1_D2	MS_DATA	GND
18	\L1_ERRO	\L1_AFED	L1_D1	L1_D0	MS_CLK	GND
19	\SPEAKER	WDG_REL	\L1_STRO	\RST_BUT	VBATIN	GND

P7204	A	B	C	D	E	F
1	nc	nc	nc	LC_VCC	LC_VEE	GND
2	nc	nc	nc	LC_BACKL	LC_DE	GND
3	nc	nc	nc	LC_P16	LC_P04	GND
4	nc	nc	nc	LC_P03	LC_P02	GND
5	nc	nc	nc	LC_P01	LC_P00	GND
6	nc	nc	nc	LC_P10	LC_P09	GND
7	nc	nc	nc	LC_P08	LC_P07	GND
8	nc	nc	nc	LC_P06	LC_P05	GND
9	nc	nc	nc	LC_P17	LC_P15	GND
10	nc	nc	nc	LC_P14	LC_P13	GND
11	nc	nc	nc	LC_P12	LC_P11	GND
12-14	KEY	KEY	KEY	KEY	KEY	KEY
15	nc	nc	nc	LC_HSYNC	LC_VSYNC	GND
16	nc	nc	nc	GND	LC_CLK	GND
17	nc	nc	nc	LC_P19	LC_P18	GND
18	nc	nc	nc	LC_P21	LC_P20	GND
19	nc	nc	nc	LC_P23	LC_P22	GND
20	nc	nc	nc	nc	nc	GND
21	nc	nc	nc	nc	nc	GND
22	nc	nc	nc	VCC [a]	VCC [a]	GND
23	nc	nc	nc	VCC [a]	VCC [a]	GND
24	nc	nc	nc	VCC [a]	VCC [a]	GND
25	nc	nc	nc	VCC [a]	VCC [a]	GND

a. +5V for internal use only.

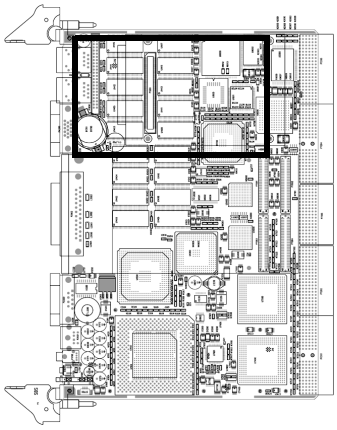
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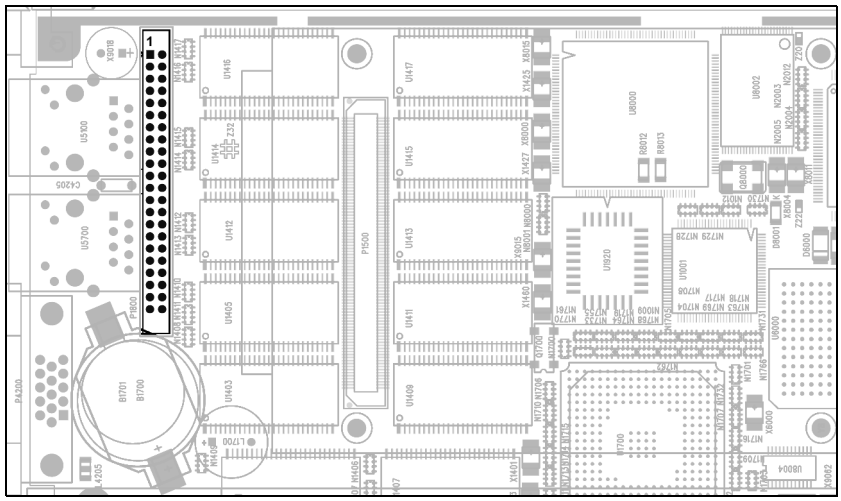
P7205	A	B	C	D	E	F
1	\S_D11	\S_D10	\S_D09	\S_D08	\S_IO	GND
2	\S_REQ	\S_C/D	\S_SEL	\S_MSG	\S_RST	GND
3	\S_ACK	\S_BUSY	\S_ATN	\S_DPO	\S_D07	GND
4	\S_D06	\S_D05	\S_D04	\S_D03	\S_D02	GND
5	\S_D01	\S_D00	\S_DP1	\S_D15	\S_D14	GND
6	\S_D13	\S_D12	\HD1_CS3	\HD1_CS1	nc	GND
7	C2_DTR	C2_RI	HD1_A2	HD1_A0	nc	GND
8	C2_TXD	C2_CTS	HD1_A1	HD1_IRQ	GPIO1	GND
9	C2_RXD	C2_RTS	\HD1_DAK	HD1_RDY	GPIO0	GND
10	C2_DCD	C2_DSR	\HD1_IOR	\HD1_IOW	nc	GND
11	C1_DTR	C1_RI	HD1_DRQ	HD1_D00	nc	GND
12	C1_TXD	C1_CTS	HD1_D15	HD1_D01	nc	GND
13	C1_RXD	C1_RTS	HD1_D14	HD1_D02	nc	GND
14	C1_DCD	C1_DSR	HD1_D13	HD1_D03	VGA_VSYNC	GND
15	\FD_HDSL	\FD_RDAT	HD1_D12	HD1_D04	VGA_HSYNC	GND
16	\FD_WPRT	\FD_TRKO	HD1_D11	HD1_D05	VGA_BLUE	GND
17	\FD_WGAT	\FD_WDAT	HD1_D10	HD1_D06	VGA_GREEN	GND
18	\FD_STEP	\FD_DIR	HD1_D09	HD1_D07	VGA_RED	GND
19	\FD_MTRO	\FD_DCHG	HD1_D08	RJ_TDP1	RJ_TDN1	GND
20	\FD_DRVO	\FD_INDX	\HD1_RST	RJ_RDP1	RJ_RDN1	GND
21	USB2+	USB1+	nc	RJ_TDP2	RJ_TDN2	GND
22	USB2-	USB1-	TERMPW	RJ_RDP2	RJ_RDN2	GND

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IDE Connector P1800

The IDE interface is designed as a 44-pin 2mm pitch male onboard connector P1800 to fit directly to a 2,5-inch IDE hard drive or flash disk. P1800 is the secondary IDE interface of the onboard IDE controller.



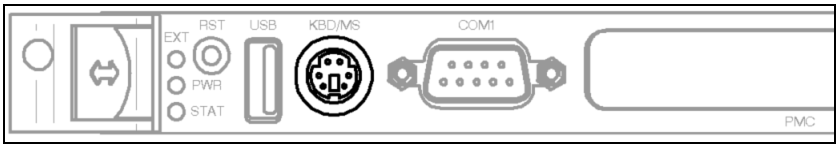


Name	P1800		Name
GND	2	1	\RST_DRV
HD_D8	4	3	HD_D7
HD_D9	6	5	HD_D6
HD_D10	8	7	HD_D5
HD_D11	10	9	HD_D4
HD_D12	12	11	HD_D3
HD_D13	14	13	HD_D2
HD_D14	16	15	HD_D1
HD_D15	18	17	HD_D0
nc	20	19	GND
GND	22	21	HD_DRQ0
GND	24	23	\HD_IOW
GND	26	25	\HD_IOR
nc	28	27	HD_RDY
GND	30	29	HD_DAK0
nc	32	31	HD_IRQ
nc	34	33	HD_A1
HD_A2	36	35	HD_A0
\HD_CS3	38	37	\HD_CS1
GND	40	39	nc
+5V	42	41	+5V
nc	44	43	GND

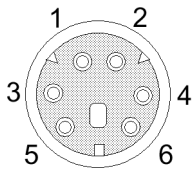
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Keyboard and PS/2 Mouse Interface P2000

The CT7 allows an easy adaptation of a keyboard to a standard 6-pin MINI-DIN connector. Also a PS/2 mouse can be connected directly or via an external cable splitter.

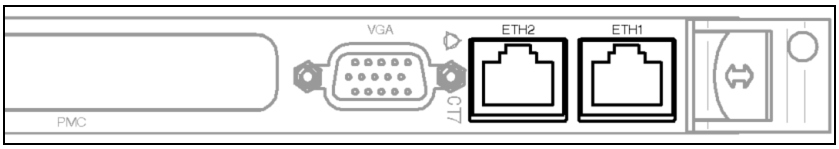


Name	P2000
Keyb. Data	1
Mouse Data	2
GND	3
Fused +5V	4
+5V unfused	-
Keyboard Clock	5
Mouse Clock	6

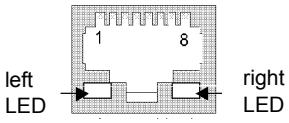


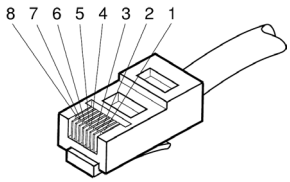
Ethernet Interface 10BaseT and 100BaseTX P5100 and P5700

The Ethernet output (front or rear) is software selectable for each channel.



Name	Ethernet1 P5100 and Ethernet2 P5700
TXD+ (RJ1)	1
TXD- (RJ2)	2
RXD+ (RJ3)	3
BIAS1 (RJ4)	4
BIAS1 (RJ5)	5
RXD- (RJ6)	6
BIAS2 (RJ7)	7
BIAS2 (RJ8)	8
FGND	





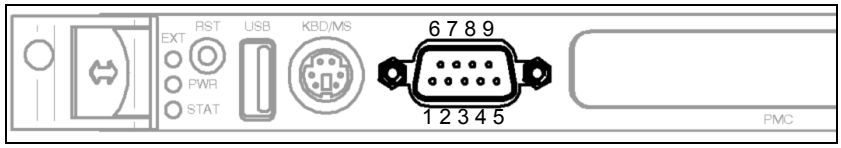
LED	Name	Function
Left	Speed	ON if 100BaseT
Right	Link/Activity	ON for link, Blink for Activity

Please note: BIAS1 and BIAS2 are connected via a resistor bridge to the center tabs of the input and output transformers.

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Serial Port COM1 P2200

The CT7 offers two RS232 serial ports. All COM ports are accessible via the transition module, additionally COM1 is accessible via the front panel connector P2200.

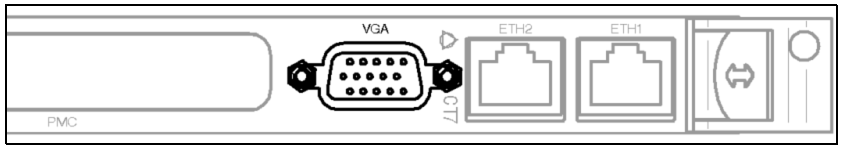


Name (RS232)	P2200
\DCD	1
\DSR	6
RXD	2
\RTS	7
TXD	3
\CTS	8
\DTR	4
\RI	9
GND	5
+5V unfused [a]	-

a. +5V supply via CTM10

VGA Interface P2400

The monitor signals are available at the front panel on a standard 15-pin female D-Sub connector.



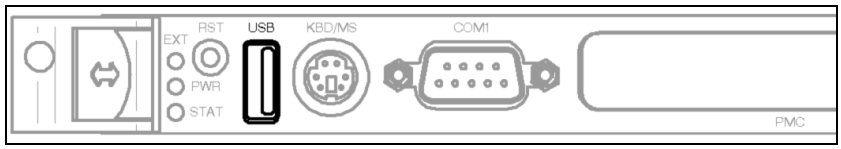
Name	P4200
RED	1
GREEN	2
BLUE	3
HSYNC	13
VSYNC	14
DDC-Data	12
DDC-Clock	15
Fused +5V	9
GND	5, 6, 7, 8, 10
nc	4, 11

n.a. not available

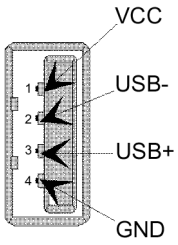
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USB Interfaces P1700

One USB channel is available at the front panel and two USB devices are available on rear IO.



Name	P1700
Fused +5V	1
+5V unfused [a]	-
USB1-	2
USB1+	3
USB2-	-
USB2+	-
GND	4



a. +5V supply via CTM10

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PMC Connectors P7001, P7002, and P7003

The following table lists the pin assignments of the PMC connector.

P7001	P7002	P7003	Pin	Pin	P7001	P7002	P7003
Nc	+12V	nc	01	02	-12V	nc	GND
GND	Nc	GND	03	04	/INTD	nc	C/BE7
/INTA	Nc	C/BE6	05	06	/INTB	GND	C/BE5
Nc	GND	C/BE4	07	08	+5V	/ENUM [a]	GND
/INTC	/GNT1 [a]	V(I/O)	09	10	SIRQ [a]	/REQ1 [a]	PAR64
GND	+5V	AD63	11	12	RES.	+3.3V	AD62
PCICLK	/PCIRST	AD61	13	14	GND	GND	GND
GND	+3.3V	GND	15	16	/GNT0	GND	AD60
/REQ0	RES.	AD59	17	18	+5V	GND	AD58
V(I/O)	AD30	AD57	19	20	AD31	AD29	GND
AD28	GND	V(I/O)	21	22	AD27	AD26	AD56
AD25	AD24	AD55	23	24	GND	+3.3V	AD54
GND	AD20	AD53	25	26	C/BE3	AD23	GND
AD22	+3.3V	GND	27	28	AD21	AD20	AD52
AD19	AD18	AD51	29	30	+5V	GND	AD50
V(I/O)	AD16	AD49	31	32	AD17	C/BE2	GND
/FRAME	GND	GND	33	34	GND	RES.	AD48
GND	/TRDY	AD47	35	36	/IRDY	+3.3V	AD46
/DEVSEL	GND	AD45	37	38	+5V	/STOP	GND
GND	/PERR	V(I/O)	39	40	/LOCK	GND	AD44
SDONE	+3.3V	AD43	41	42	/SBO	/SERR	AD42
PAR	C/BE1	AD41	43	44	GND	GND	GND
V(I/O)	AD14	GND	45	46	AD15	AD13	AD40
AD12	GND	AD39	47	48	AD11	AD10	AD38
AD9	AD8	AD37	49	50	+5V	+3.3V	GND
GND	AD7	GND	51	52	C/BE0	RES.	AD36
AD6	+3.3V	AD35	53	54	AD5	RES.	AD34
AD4	RES.	AD33	55	56	GND	GND	GND
V(I/O)	I2CSDA [a]	V(I/O)	57	58	AD3	I2CSCL [a]	AD32
AD2	GND	Nc	59	60	AD1	GND	nc
AD0	/ACK64	Nc	61	62	+5V	+3.3V	GND
GND	GND	GND	63	64	/REQ64	RES.	nc

a. Proprietary signals used for special functions. These pins are defined as reserved in the IEEE P1386.1 specification.

Nc	Not connected
RES	Reserved. Do not connect anything!
V(I/O)	I/O Voltage, connected with +5V
+12V/-12V	Only available if connected to CPCI backplane.

PMC-I/O Connector P7004

Pin 1 of the I/O connector is GPIO1, Pin 2 is GPIO2 and so on. All traces are not connected to any signal onboard.

Extension Board and Transition Module Connectors

Please refer to the appendix chapters for interface location and connector pinouts for the optional extension boards and transition modules.

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CHAPTER 5 Resources

Chapter Scope

This chapter describes system resources, such as memory mapping, register set and default interrupt request assignments.

Memory Map

The table below shows the memory address area used by the CT7.

Address	Size	Used by
$00000 - $9FFFF	640 Kbytes	System RAM
$A0000 - $BFFFF	128 Kbytes	Video RAM (if enabled)
$C0000 - $DFFFF	128 Kbytes	Used by PCI ROMs: VGA, SCSI, Ethernet
$E0000 - $FFFFF	128 Kbytes	System BIOS
$100000 - $3FFFFFFF	depends on avail. DRAM	Extended RAM
$4000000 - $FFFBFFFF	depends on avail. DRAM	Dynamically used by PCI devices
$FFFC0000 - $FFFFFFFF	256 Kbytes	System BIOS

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Register Set

The following section provides an overview of the registers located in the I/O address area of the CT7.

Note: The address location of PCI devices such as SCSI or Ethernet are not described in the following tables because the System BIOS automatically configures (PnP, Plug and Play) each PCI device to avoid address conflicts. Many device drivers show the actual address locations after installation and loading.

Standard Register Set

The standard register set is equal to all standard PC/AT systems. The table below provides an overview of the address ranges occupied by these registers.

I/O Address Range (Hex)	Function
0000 - 000F	DMA Controller 1
0020 - 0021	Interrupt Controller 1
0040 - 0043	Counter / Timer
0060	Keyboard Controller
0061	NMI Status and Control
0064	Keyboard Controller
0070 - 0071	RTC, NMI Mask
0080 - 008F	DMA Page register
00A0 - 00A1	Interrupt Controller 2
00B2 - 00B3	Power Management
00C0 - 00DE	DMA Controller 2
00F0 - 00F1	Coprocessor
0160 - 016F	Reserved; see below
0170 - 0177	Secondary IDE
01F0 - 01F7	Primary IDE
0278 - 027F	LPT [a]
02E8 - 02EF	COM port [a]
02F8 - 02FF	COM port [a]
0378 - 037F	LPT [a]
03BC - 03BF	LPT [a]
03E8 - 03EF	COM port [a]
03F2 - 03F7	Floppy
03F8 - 03FF	COM1 port [a]

a. Via setup three address ranges can be defined for the parallel interfaces and four address ranges for the serial interfaces.

Plug and Play Devices

See Programmer's Manual.

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Interrupts

The interrupt routing for standard components such as COM1/2 or LPT1 is in compliance with standard PC/AT systems. Unused interrupts can be used for add-on cards or other board specific PCI devices such as SCSI and Ethernet. The CT7 BIOS setup allows manual routing for the PCI devices.

Hardware IRQ		IRQ Source
INTC1	IRQ00	System Timer
	IRQ01	Keyboard
	IRQ02	Cascade from INTC2
	IRQ03	COM2 / COM1 [a]
	IRQ04	COM1 / COM2 [a]
	IRQ05	LPT1 [a] / PnP/PCI [b]
	IRQ06	Floppy Disk Controller
	IRQ07	LPT1 [a] / PnP/PCI [b]
INTC2	IRQ08	Real Time Clock
	IRQ09	Power Management Contr./PCI [b]
	IRQ10	PnP/PCI [b]
	IRQ11	PnP/PCI [b]
	IRQ12	PS/2 Mouse [c]
	IRQ13	Numeric Coprocessor
	IRQ14	External IDE [d]
	IRQ15	Onboard IDE [e]
NMI	Parity Error, ECC Error, System Error	Memory Controller

a. This interrupt is available when no ISR (Interrupt Service Routine) is installed.
b. Interrupts are available for Plug and Play PCI devices
c. This interrupt is available when PS/2 mouse is not connected.
d. This interrupt is available when the primary IDE controller is disabled in SETUP.
e. This interrupt is available when the secondary IDE controller is disabled in SETUP.

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CHAPTER 6 Function Blocks

Chapter Scope

This section gives a brief overview over the software interfaces of onboard devices on the CT7 CompactPCI Single Board Computer.

Standard AT Devices

Please refer to interface specifications laid down in industry standards and hardware reference documents for standard AT devices.

DMA Controller

In standard AT compatible PCs, as well as on the CT7, the two DMA controllers integrated on the board are internally cascaded. Both controllers are compatible with the Intel 8237A. The DMA Controller 1 (DMAC1) is used for byte-wide transfers while the DMAC2 is used for word-wide transfers.

Interrupt Controller

The Interrupt controller on a standard PC consists of two 82C59A devices with eight interrupt request lines each. The two controllers are cascaded so that 14 external and two internal interrupt sources are available.

The master interrupt controller provides IRQ[7...1], the slave interrupt controller provides IRQ[15...8]. IRQ2 is used to cascade the two controllers, IRQ0 is used as a system timer interrupt and is tied to interval timer 1, counter 0. The remaining 14 interrupt lines are mapped to various onboard devices.

Each 82C59A provides several internal registers. The interrupts at the IRQ input lines are handled by two registers, the interrupt request register IRR and the in-service register ISR. For programming details see the 82C59A data sheet.

Timer

Standard PCs like the CT7 are equipped with a 8254 compatible timer. This timer contains three counters. Each counter output provides a key system function. Counter 0 is connected to interrupt controller input IRQ0 and provides a system timer interrupt for time-of-day, floppy disk timeout and other system timing functions. Counter 1 generates a refresh request signal and Counter 2 generates the sound for the speaker.

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The following table gives an overview over the 8254 functions.

Interval Timer Functions	
Function	Counter 0 (System Timer)
Gate	Always on
Clock In	1.193 MHz (OSC/12)
Out	IRQ0 (INT1)
Function	Counter 1 (Refresh Request)
Gate	Always on
Clock In	1.193 MHz (OSC/12)
Out	Refresh Request
Function	Counter 2 (Speaker Tone)
Gate	Programmable via Port $061
Clock In	1.193 MHz (OSC/12)
Out	Speaker

The counter/timers are programmed by I/O accesses. A single control word register controls the operation of all three counters. For more information on programming and a detailed register description see the 8254 data sheet.

Real Time Clock

The RTC is a low-power clock that provides a time-of day clock and a 100-year calendar with alarm features and battery backed operation. The time-of-day function includes 14 control registers. Other features include maskable interrupt sources and 242 bytes of general purpose CMOS RAM used by system BIOS. Valid RAM data and time can be maintained after power down through the use of an external battery source. The RTC is software compatible to the Dallas DS1287 and the Motorola MC146818.

Keyboard and Mouse Controller

The communication between the PC and the keyboard is managed by a device compatible to the Intel 8042 microcontroller, which also provides the PS/2 mouse interface.

EIDE/ATAPI Interface

The CT7 offers two independent EIDE/ATAPI interfaces. Both devices are logically connected to the primary PCI bus. Therefore a high data transfer rate is achievable. The signals of the primary EIDE interface are available at the backpanel IO connector only. The signals of the secondary EIDE interface are used for connection of a 2,5" HDD or flash disk via connector P1800 on board.

The CT7 System BIOS automatically detects a connected EIDE HDD or flash disk and enters the corresponding drive parameters into the BIOS setup. This feature allows faster and easier handling of varying types of EIDE hard disks. At the primary EIDE interface two hard disks can be connected. In this case one HDD must be configured as master and the other one as slave. Read the hard disk manual to find out where these jumpers are located on your drive. The optional 2,5” onboard disk is connected to an onboard EIDE connector (secondary EIDE interface).

Using EIDE and SCSI devices: MS-DOS 6.22 can handle up to seven hard disks. The PC allows the simultaneous use of EIDE and SCSI hard disks. BIOS setup allows reordering drives to boot from either SCSI or EIDE drives.

Please note: For correct operation of the EIDE interface, a maximum cable length of 12 inches (30 cm) must not be exceeded.

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Serial Interfaces

The CT7 serial ports are fully compatible with the NS16450 and NS16550. This means that each serial interface provides a 16 byte FIFO and therefore offers a higher performance than earlier used standard serial interfaces. The UARTs have programmable baud rate generators capable of 50 to 115200 baud. There are four address locations defined for serial interfaces on standard PCs. The two serial interfaces are I/O mapped and can occupy four address ranges.

Parallel Interfaces

The parallel ports are fully compatible with the new IEEE 1284 standard, including level 2 support. The parallel ports consist of an Enhanced Parallel Port (EPP1.7/1.9) and an Extended Capabilities Port (ECP 16Byte FIFO + DMA support). The new modes allow higher transfer rates up to 1 Mbyte/s. Via BIOS Setup, the operating modes of the parallel interface can be selected.

The following modes are supported:

Mode	Average transfer rate (Read)	Average transfer rate (Write)
Standard	100 KByte/s	200 KByte/s
EPP	1 MByte/s	1 MByte/s
ECP	1 MByte/s	1 MByte/s

On a standard PC, three address areas are defined for a parallel interface. The parallel interface is I/O-mapped and can occupy three address ranges.

The address range $3BC cannot be used with EPP operation.

Floppy Controller

The CT7 floppy controller is fully compatible with the PC8477, containing a superset of the NEC uPD72065B and the N82077AA.

The following formats are supported:

Format	Disk Size	Disk Media	formatted Tracks
720 Kbyte	3.5	Double Density 96 tpi	80
1.44 Mbyte	3.5	High Density 135 tpi	80

The floppy controller uses various I/O addresses in the PC I/O address space.

Graphics Controller

The Graphic Controller CT69030 (optional CT69000) has the following features:

- Highly integrated Flat Panel and CRT GUI
- Max. pixel clock 170 [a] / 135 MHz
- Accelerator & Multimedia Engine, Palette/DAC, Clock Synthesizer, and integrated frame buffer
- Integrated High Performance 41)/2 Mbytes 83MHz SDRAM memory
- Hardware Windows Acceleration: 64-bit Graphics Engine with 2D acceleration
- Dual Independent Display for CRT and Flat Panel (CT69030 only)

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Video Modes

The following video modes are available:

Resolution	max. Colors	Pixel clock(MHz)	Hor. Freq.(kHz)	Vert. Freq.(Hz)
640x480	16 M	25.175	31.5	60
		31.5	37.5	75
		36	43.3	85
800x600	16 M	36	35.5	56
		40	37.9	60
		49.5	46.9	75
		56.25	53.7	85
1024x768	6553616 [a]	44.9	35.5	43 (Interlaced)
		65	48.4	60
		78.75	60	75
		94.5	68.7	85
1280x1024	25665536 [a]	78.75	47	43 (Interlaced)
		108	64	60
		135	80	75
1600x1200 [b]	256	162/2	75	60
1280x1024 Dual Display [a]	256, CRT	108	64	60
	256, FlatP			60

a. CT69030
b. Flat panel only on CT69000

Supported Panel Types

The following displays have been tested with the CT7:

Manu-facturer	Part Number	Resolution	Technology	Panel Drive	Interface Bit	Colors
NEC	NL6448AC33-18	640x480	TFT	SS	16/24	6
Sharp	LQ10S21	800x600	TFT	SS	16/24	6
		1024x600	TFT	LVDS	2x12	5 [a]
NEC	NL10276BC28-21A	1024x768	TFT	LVDS	18	6

a. with FRC

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LCD Signal Mapping

Details for easy adaptation of EL, Plasma, monochrome, color STN and 9,12,18, 24 Bit TFT displays can be found in the data sheet of the CT69030 (optional CT69000). For a short overview see the following table for the assignment of the LCD-signals for the types available:

	Mono	Mono	Mono	Color	Color	Color	Color	Color	Color	Color
	SS	DD	DD	TFT	TFT	TFT-HR	STN SS	STN SS	STN DD	STN DD
Pixels per CLK	8	8	16	1	1	1	5-1/3	2-2/3	5-1/3	2-2/3
	8 Bit	8 Bit	16 Bit	9/12/16	18/24	18/24	8 Bit	16 Bit	8 Bit	16 Bit
LC_P0	P0	UD3	UD7	B0	B0	FB0	R1	R1	UR1	UR0
LC_P1	P1	UD2	UD6	B1	B1	FB1	B1	G1	UG1	UG0
LC_P2	P2	UD1	UD5	B2	B2	FB2	G2	B1	UB1	UB0
LC_P3	P3	UD0	UD4	B3	B3	FB3	R3	R2	UR2	UR1
LC_P4	P4	LD3	UD3	B4	B4	SB0	B3	G2	LR1	LR0
LC_P5	P5	LD2	UD2	G0	B5	SB1	G4	B2	LG1	LG0
LC_P6	P6	LD1	UD1	G1	B6	SB2	R5	R3	LB1	LB0
LC_P7	P7	LD0	UD0	G2	B7	SB3	B5	G3	LR2	LR1
LC_P8			LD7	G3	G0	FG0	CLKU	B3		LG1
LC_P9			LD6	G4	G1	FG1		R4		UB1
LC_P10			LD5	G5	G2	FG2		G4		UR2
LC_P11			LD4	R0	G3	FG3		B4		UG2
LC_P12			LD3	R1	G4	SG0		R5		LG1
LC_P13			LD2	R2	G5	SG1		G5		LB1
LC_P14			LD1	R3	G6	SG2		B5		LR2
LC_P15			LD0	R4	G7	SG3		R6		LG2
LC_P16					R0	FR0				
LC_P17					R1	FR1				
LC_P18					R2	FR2				
LC_P19					R3	FR3				
LC_P20					R4	SR0				
LC_P21					R5	SR1				
LC_P22					R6	SR2				
LC_P23					R7	SR3				
LC_Backl					Backl					
LC_CLK					CLK					
LC_DE/M					DE/M					
LC_Hsync/LP					Hsync					
LC_Vsync/FLM					Vsync					

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Please observe the following:

— Take care when using 9, 12 bit TFT displays: The high order output lines should be used when only 9 or 12 bits of the 9/12/16 bit TFT-interface are needed. The low order bits should be left unconnected.
— Take care when using 18 or 24 bit TFT displays with the 9/12/16 bit TFT-interface: The high order output lines should be connected to the high order lines of the display. The remaining low order inputs to the display should be connected to GND.

Software Installation. Since the Chips & Technologies graphic chip is used on a large number of computers, many operating systems like OS/2,Windows NT, Windows 95 and Windows 98 already include high resolution drivers.

The software media (CD-ROM or floppy disks) supplied with the CT7 includes the most commonly used software drivers and utilities. This software and more is available from our Website or through Technical Support. See section “Technical Support” on page 91 for details.

SCSI Interface

SCSI is the abbreviation for “Small Computer System Interface”. The SCSI bus is a fast, bidirectional parallel bus for communication between computers and peripheral units. The SCSI bus defines two adapter types, the host adapter and the peripheral adapter. The host adapter controls the communication between the computer module and the SCSI bus. The peripheral adapter controls the data transfer between the peripheral units like hard disks, CD-ROM, laser printer or tape drives and the SCSI bus. Today in most cases the peripheral adapter is integrated in the applied devices, therefore only cable from the SCSI host adapter to the peripheral devices is needed.

The SCSI interface on the CT7 is a host interface, consisting of the PCI Bus SCSI controller Symbios 53C875. This controller chip drives the SCSI protocol in accordance to the ANSI X3.131-1986 (SCSI-1) and ANSI X3.131-199x (SCSI-2) specification, with the following functions:

— Arbitration
— Selection
— Message Handling
— Disconnect/Reconnect
— Data Bus Parity Checking
— Termination of the SCSI Signals
The SCSI interface is terminated on both sides of the connector cable. The terminator on the CT7 is an active terminator and cannot be disabled. The CT7 must reside on one end of the SCSI chain. The other, usually on the peripheral unit must also be an active type. If more than one unit is connected to the host adapter, all terminators on the peripheral units must be removed or disabled, except for the one at the far end of the SCSI cable chain.
— Number of SCSI Devices
All units connected to the SCSI bus (including peripheral controller and the host adapter) must have an unique ID-number with which they may be accessed. 16 IDs total (0...15), named ID numbers, can be assigned on the SCSI bus. These ID numbers can be changed by jumpers or switches located on the device. The SCSI controller on the CT7 usually reserves the ID number 7, meaning that ID numbers 0...6, 8...15 can be assigned to the peripheral devices. The CT7 SCSI controller device ID can be altered by means of the SCSI BIOS

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configuration menu. When using more than two devices on the SCSI bus, make sure that they all have unique IDs. If there are more SCSI hard disks in the system, the hard disk with the lowest ID number is the first hard disk unless SCSI BIOS is used to reverse the scan order or boot drive selection. The CT7 tries to startup the operating system from the first hard disk. SCSI scan order can be changed within the SCSI BIOS configuration. EIDE versus SCSI scan order can be altered in the system BIOS Setup. Please see the SCSI specification for details on correct cabling.

— Cable characteristic

The characteristic impedance of the cable required is shown below:

Characteristic impedance:

SCSI-2	90 ohms to 132 ohms
Ultra-20	90 ±10 ohm
Signal attenuation:	0,095 dB maximum per meter at 5 MHz
Pair-to-pair propagation delay delta:	0,20 ns maximum per meter
DC resistance:	0,230 ohms maximum per meter

For correct operation of the SCSI bus, the cable length shown in the table below must not be exceeded.

SCSI-Type	Mbyte/s	Bus	No. of devices	Cable length
SCSI-2	≤ 5	8 Bit	8	6 m
SCSI-2 Fast	10	8 Bit	8	3 m
SCSI-2 Fast Wide	10	8 Bit	8	3 m
Ultra	20	8 Bit	≤ 4	3 m
Ultra	20	8 Bit	8	1.5 m
Ultra Wide	40	16 Bit	8	1.5 m

Please observe the following:

— Using cables within the specified characteristics is necessary for reliable system operation.
— The active Terminator on the CT7 can not be disabled.
— The minimum cable length between devices is 20 cm.
— The devices should be evenly spaced on the SCSI cable.

Software Installation. The 53C875 SCSI controller provides a total SCSI solution in PC environments with the Symbios SCSI Device Management System (SDMS). SDMS provides driver support for hard disk, removable media and CD-ROM peripherals for the DOS, Windows 3.xx, Windows95/98/NT, OS/2 and Novell 3.x, 4.x and various UNIX environments.

The software media (CD-ROM or floppy disks) supplied with the CT7 includes the most commonly used software drivers and utilities. This software and more is available from our Website or through Technical Support. See section “Technical Support” on page 91 for details.

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PMC Interface

The PCI Mezzanine Card (PMC) Interface is an additional slot for parallel mounted expander or option cards. Please see chapter “PCI Mezzanine Card (PMC)” on page 89 of this manual for further details. The CT7 PMC Connector interface is described on page 32.

IPMI

A Baseboard management controller (BMC) is implemented on the CT7, the interfacing between host processor and the system management network. This controller can also work as a Peripheral management controller (PM). The BMC is mapped into the local CPUs I/O address space, specified in the “Programmer’s Manual.” The functionality of the IPMI controller is described in the 'CT7 IPMI Programmer's Manual'.

For information about the System Management in CompactPCI systems, please refer to the PICMG 2.9 specification 'System Management Specification'. More information about IPMI can be found on the Intel website.

IPMB. The *I*ntelligent *P*latform *M*anagement *B*us (IPMB) is an I2C-based bus that provides a standardized interconnection between different CPCI-boards within a chassis. The standardized connection to the backplane is shown below:

P7201	Name	Description
B17	IPMB_SCL	Serial Clock
C17	IPMB_SDA	Serial Data
A4	VSM	Power Supply for all IPMI-devices

Private I2C. The Private IPMI I2C bus is equivalent to the SMBus (described in 'Additional devices/SMB'). The IPMI-controller works as a second Master on the I2C bus to read the SMBus devices.

Software Installation. The software media (CD-ROM or floppy disks) supplied with the CT7 includes the most commonly used software drivers and utilities. This software and more is available from our Website or through Technical Support. See section “Technical Support” on page 91 for details.

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Ethernet Interface

The Ethernet controller 82559ER from Intel used with the CT7, is a high performance Fast Ethernet 10/100Mbit PCI controller. Two channels are available on the CT7.

For registration and identification of a workstation in a LAN, a unique ID number is required. Each network card is assigned a unique ID number, which resides in an Ethernet address ROM on the CT7.

An Ethernet boot option can be enabled in BIOS setup. The Ethernet Connector (front/rear) is selectable via BIOS Setup.

Software Installation. The drivers available for the Ethernet controller 82559ER support a large number of operating systems. The table shows operating systems supported by the available software:

Type	System
ODI	DOS
NDIS	DOS
NDIS	Windows NT 4.0, Windows 98, Windows 2000

The software media (CD-ROM or floppy disks) supplied with the CT7 includes the most commonly used software drivers and utilities. This software and more is available from our Website or through Technical Support. See section “Technical Support” on page 91 for details.

Additional devices

Hot Swap

The Hot Swap compliant CT7 allows the orderly insertion and extraction under power, without adversely affecting system operation. The Hot Swap process can be described in terms of three processes:

— Physical Connection Process - describes the acts of:
Hot Insertion - by which CT7 is installed in a live system (as a non-system CPU)
Hot Extraction - by which CT7 is removed from a live system (as a non-system CPU)
— Hardware Connection Process - Power Up/Down of the CT7 onboard voltages
— Software Connection Process - Connection/disconnection of the software layer(s)

At the end of the Physical Connection Process (the shortest Pin has connection) the Hot Swap controller powers up the onboard voltages in a defined manner.

After the handle switches are closed, the 21554 bridge generates an insertion-event, which signals a Hot Swap insertion to the system. The system then scans the CPCI-bus for changes.

Please note, that the CPCI backplane must support this function and appropriate software must be installed for HotSwap to work properly.

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SMB bus devices

The CT7 uses a serial 2-wire I2C bus to communicate with several onboard devices:

Device	Desig.	SMB address
PIIX4 slave port (*)	U1700	0001000Xb
Clock synthesizer (*)	U1000	1101001Xb
Serial Eeprom (24C04)	U1981	101010(A81)Xb
SPD Eeprom Bank 1/2 (*)	U1436	1010000Xb
SPD Eeprom Bank 3/6 (*)	U1437	1010001Xb
SPD Eeprom Bank 5/6 (*)	U1436	1010010Xb
SPD Eeprom Bank 7/8 (*)	U1437	1010011Xb
Temperature sensor (MAX1617A)	U1982	1001111Xb

Devices marked by (*) are handled by BIOS. It is strongly recommended not to access these devices by user software.

SMBus external

The SMBus is available on the P7002 CPCI connector for external use. The user is responsible for avoiding any address conflicts with the onboard SMBus devices.

Temperature Sensor MAX1617A

A Maxim MAX1617A temperature sensor is implemented on the CT7 board. The sensor is located close to the CPU and shows the die-temperature of the CPU and the local onboard temperature. The sensor has an over-temperature output integrated, which can be used to take actions like reducing the CPU speed. For programming information please see the CT7 'User's and Programmer's Manual '.

More information on the MAX1617A can be found in the data sheet from MAXIM.

Serial EEPROM

For storage of user data a serial EEPROM is implemented on the CT7 board. It is a standard 24C04 type EEPROM with 512 bytes. More information about writing and reading the contents can be found in the data sheets from the manufacturer (e.g. Microchip Technology, SGS Thomson, Atmel, Catalyst and many others).

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Power Management Event

A Power Management Event can be initiated on CT7 by one of the following events.

Event	Description
ENUM	Wake CT7 [a] if a non-systemboard is removed or inserted
REMOVE	Wake CT7 if user wants to remove this CT7
Wake on LAN	Wake CT7 by ethernet event
Wake on IO	Wake CT7 by IO-device i.e. Modem, KB, MS, etc.

a. CT7 in System slot

INTP, INTS

The INTP and INTS signals (PICMG2.0) are available on the P7201_D4/E4. For CT7 in System Slot, the high active INTP is used as a steerable interrupt which is routed to any legacy ISA interrupt. In Peripheral Slot, INTP can be generated to trigger an interrupt in the system board. The corresponding interrupt for INTP is selectable via BIOS Setup.

Please note: Only one peripheral board is allowed to use INTP.

For CT7 in System Slot, the INTS signal can be used as serialized interrupt, in compliance with the “Serialized IRQ Support for PCI Systems” specification, Rev. 6.0. INTS is synchronous to the PCI clock an has the requirement of meeting the PCI specification.

ENUM#

ENUM (PICMG 2.0, open-collector) is available on P7201_C25. This signal shall be driven by hot swap compatible boards after insertion and prior to removal. For CT7 in System Slot, the input ENUM is able to generate an interrupt to force the software to interrogate all boards within the system for resource allocation regarding I/O, memory and interrupt usage.

If the CT7 works in a peripheral slot, the non-transparent bridge generate the output ENUM conform to the specification of a Hot Swap compliant board.

For programming information about this PnP device, please see the CT7 'Programmer's Manual '.

Geographic Addressing

If the backplane supports geographic Addressing, the CT7 can detect the unique Address in a CPCI-System with the GA[4...0] Pins (PICMG 2.0) on P7202.

For programming information please see the CT7 “Programmer's Manual.” For more information about geographic addressing in appliance to system management, see PICMG 2.9.

GPIO0/1

Two GPIO-Pins are available on P7205. These Pins are open drain signals with a 2k2 Ohm pull-up and can be used i.e. for a user I2C-bus. The IO-mapped register GPCR controls the Signals. For more information please see the “Programmer's Manual.”

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Watchdog, Powerfail Monitor

For security of application software, the CT7 offers a software controlled hardware watchdog capable of issuing a reset signal if its time-out interval expires. To prevent the watchdog from generating a reset signal, it must be re-triggered within a 0.5-second interval by reading the Watchdog Control Register WCR.

Since standard software doesn't trigger the watchdog periodically, it is disabled after reset. The watchdog function can be enabled via the Watchdog Control Register WCR. Once the watchdog is enabled, it must be reset periodically by reading WCR within 0.5 seconds. Otherwise, a reset pulse with duration of 200 msec is generated to restart the system. For more information please see the “Programmer's Manual.”

Programmable Timer

An additional programmable Timer is implemented on the CT7. The timer can be programmed to run only once, or in repeat mode. The timer can generate an Interrupt. For more information please see the “Programmer's Manual.”

Timer values: 200us; 500us; 1.00ms; 4.00 ms; 5.00ms; 10.0ms; 20.0ms

LED Outputs

Three LED’s are available at the front panel.

Color	Function
Blue	Hot Swap LED
Red	Fail
Green	run

In Reset State, red LED is on state. The green LED is off.

During power up, BIOS turns both LED's off to indicate the CT7 has started. Before entering the OS boot sequence, the green LED is turned on. While in the OS, user software is free to use both LED's for their own purpose.

For further information please see the “Programmer's Manual.”

Reset Button

There is a Reset Button onboard. An external Reset button may be connected between the appropriate IO connector at the back side and GND. The PRST# on P7202_C42 (PICMG2.0) is used as Reset input only for the system board and is in this case, compatible to the onboard button.

— If the CT7 works as a System board:
The push button will issue a hard power on reset. The reset signal is active for all subsystems of the CT7.

— If the CT7 works as a Peripheral board:
1) The push button will issue a hard power On reset. The reset signal is active for the CT7 including PMC modules, but will not reset other peripherals or the System board.
2) The CT7 will signal a HotSwap Insertion event when reset.

Speaker

An external standard PC compatible speaker may be connected between the appropriate IO connector at the backside and +5V.

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CHAPTER 7 Specifications

PCB FR4 Multilayer

Size Total board size: 6U, 4 HP
Total size with optional extension board 8HP

Dimensions PCB: 233,35 mm x 178 mm x 40 mm (with extension board)

Weight approx. 650 g (with frontpanel, extension board, HDD, CPU, and heatsink), depending on model and style

Power Consumption The following table is intended to help you calculate the power consumption of a CT7 system. For measurement, the CT7 board is mounted on a CPCI backplane, without keyboard and hard disk. The operation system (MS-DOS) comes up from floppy disk. During measurement, the power consumption of the backplane and the floppy drive can be ignored.

Order No.	Configuration	Typical Current at +5V	
		with Power Management	without Power Management
CT7P722500F0C	Celeron 400 MHz 64 MB SDRAM 66 MHz FSB	1,7 A	4,5 A
CT7P846xx1FxC	Celeron 500 MHz 128 MB SDRAM 100 MHz FSB 2 x Ethernet WideSCSI	2,1 A	3,8 A

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Order No.	Configuration	Typical Current at +5V	
		with Power Management	without Power Management
CT7P84880480C	PIII 850 MHz 1 GB SDRAM 100 MHz FSB 2 x Ethernet WideSCSI 4 MB VGA	3,0 A	6,5 A

— For a keyboard connected add 100 mA (typical).
— With extension board ET7 installed add 400 mA (typical).
— Connectors P1700, P2001, and P4200 provide fused VCC voltage (+5V). The total current drawn from this source may not exceed 1,0 A.

Methods for measurement are defined as follows:

DOS prompt with power management

— Boot disk with MS-DOS 6.22
— no autoexec.bat
— config.sys: device=power.exe adv
— wait until CPU enters HTL state
— measure current on DOS prompt

DOS prompt without power management

— Boot disk with MS-DOS 6.22
— no autoexec.bat
— config.sys: device=power.exe off
— measure current on DOS prompt

Onboard Lithium Battery

BR2032, estimated life time approx. 10 years (45°C)

External Battery Input

Input range 2,7 to 4,5 V, max. current (3,0 V) 5 uA

Environment Conditions

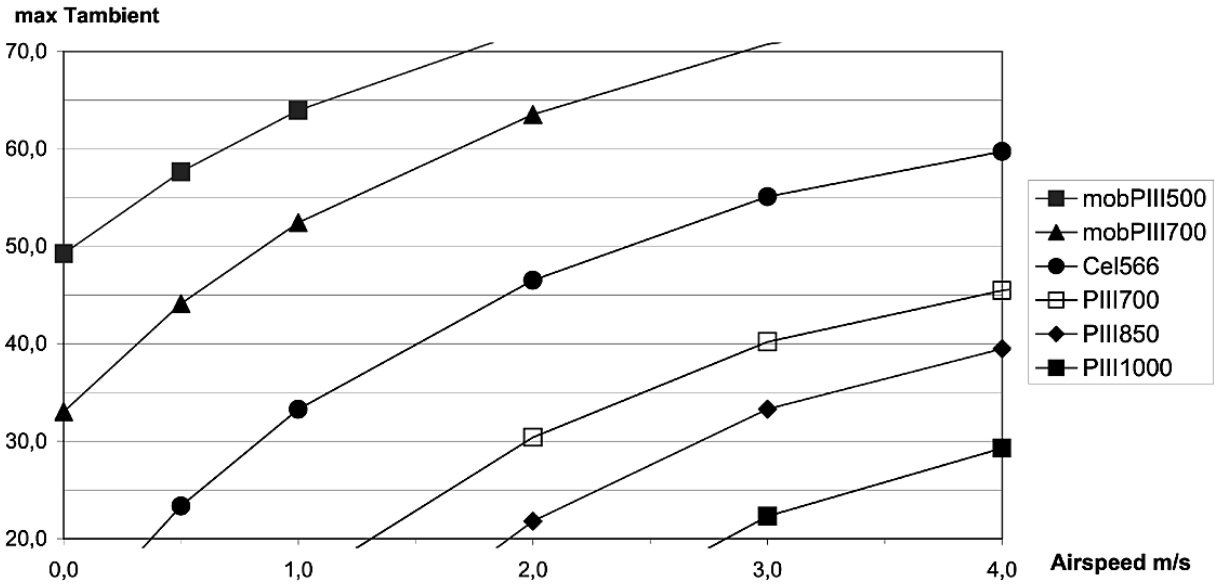
Ambient temperatures and humidity values for the CT7:

	C-Style	I-Style
High Temperature		
— Storage	+85°C	+85°C
— Operating (see diagram below)		
Low Temperature		
— Storage	-40°C	-40°C
— Operating	0°C	-40°C
Temperature Shock		
— Storage	±10 °C/min	± 20 °C/min
— Operating	± 5 °C/min	± 10 °C/min

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	C-Style	I-Style
Rel. Humidity		
— Storage	up to 95%, non-condensing	
— Operating	up to 95%, non-condensing	

For highest operating temperatures (C-Style and I-Style) please refer to the following diagram:



— **The highest admissible operating temperature for the CT7 CompactPCI Single Board Computer is 70°C!**
— 0 m/s airflow means convention cooled only.
— The core temperature of the CPU can be read out via the onboard temperature sensor. The value must be kept within the limits in the following table for all operating conditions. These temperature values are already included in the airspeed diagram above.

CPU Type / Speed	max. T_{core}
Mobile Celeron 400 MHz	100°C
Mobile Pentium III 500 MHz	100°C
Celeron FCPGA 566 MHz	90°C
Pentium III 700 MHz	80°C
Pentium III 850 MHz	80°C
Pentium III 1 GHz	75°C

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Electrical Characteristics

The supply voltages are +5V, +12V and -12V if needed on the PMC slot. All Output or Input voltages of the CT7 boards have an overcurrent protection. The maximum current for each voltage is shown below.

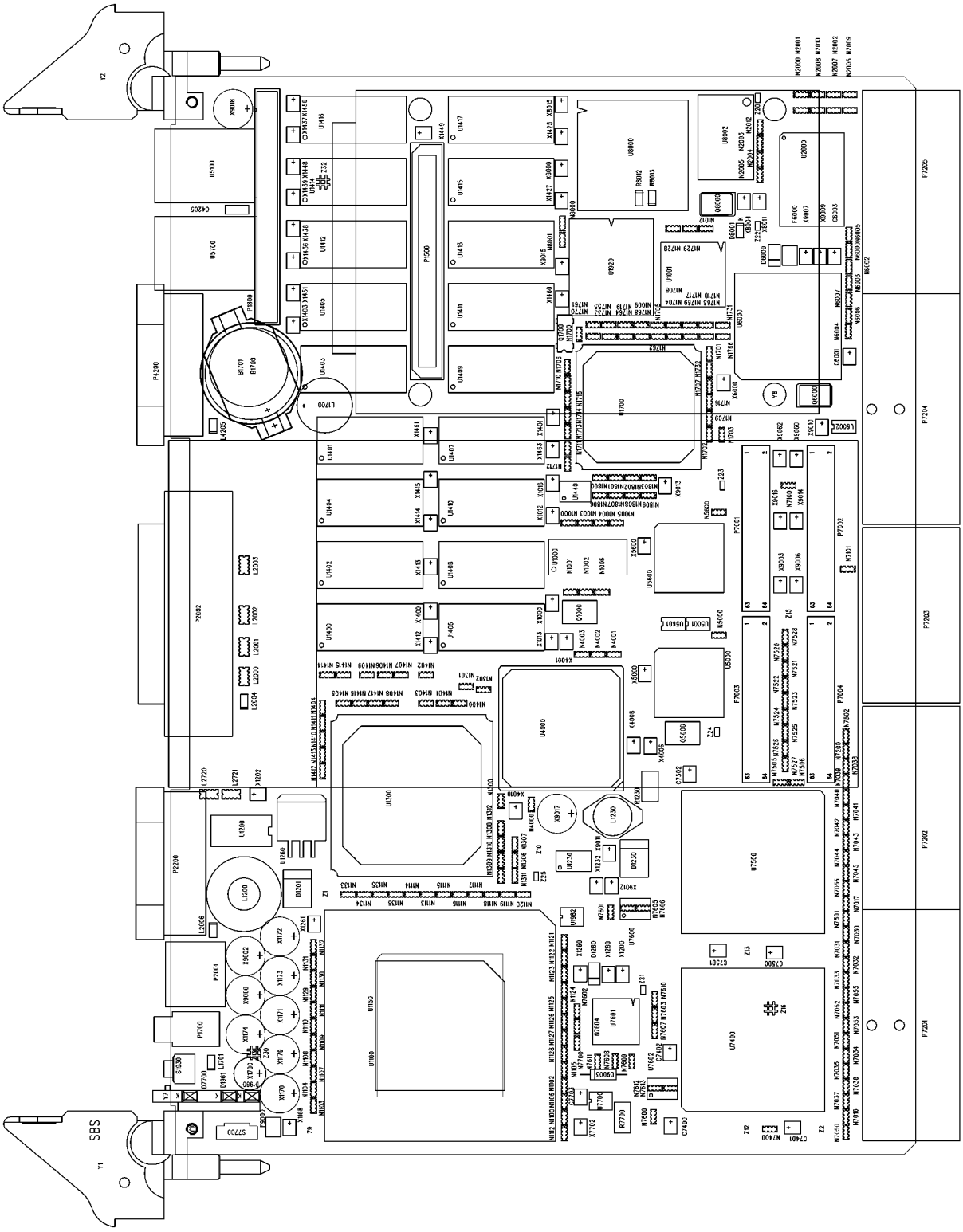
Name	U	Imax	Description	Fuse
+5VIN	5V	10,6A	Main Power supply voltage	U7700 [a]
+12VIN	12V	0,85A	Supply for HotSwap controller and PMC-Module	U7700 [a]
-12VIN	-12V	0,45A	Supply for PMC-Modul	U7700 [a]
FUSE_VCC	5V	2A	Supply for Frontpanel IOs: KB/MS, USB, CRT-DCD	F9001 [b]
SCSI_TERMPW	5V	2A	Power for SCSI Termination	F6001 [b]

a. LTC1643L-1CGN (Linear Technologies)
b. TPS2034D (Texas Instruments)

Please note: A short circuit on FUSE_VCC or SCSI_TERMPW will result in a power fail condition and all onboard voltages of the CT7 will be shut down. To restart the system, switch the Power off and on again.

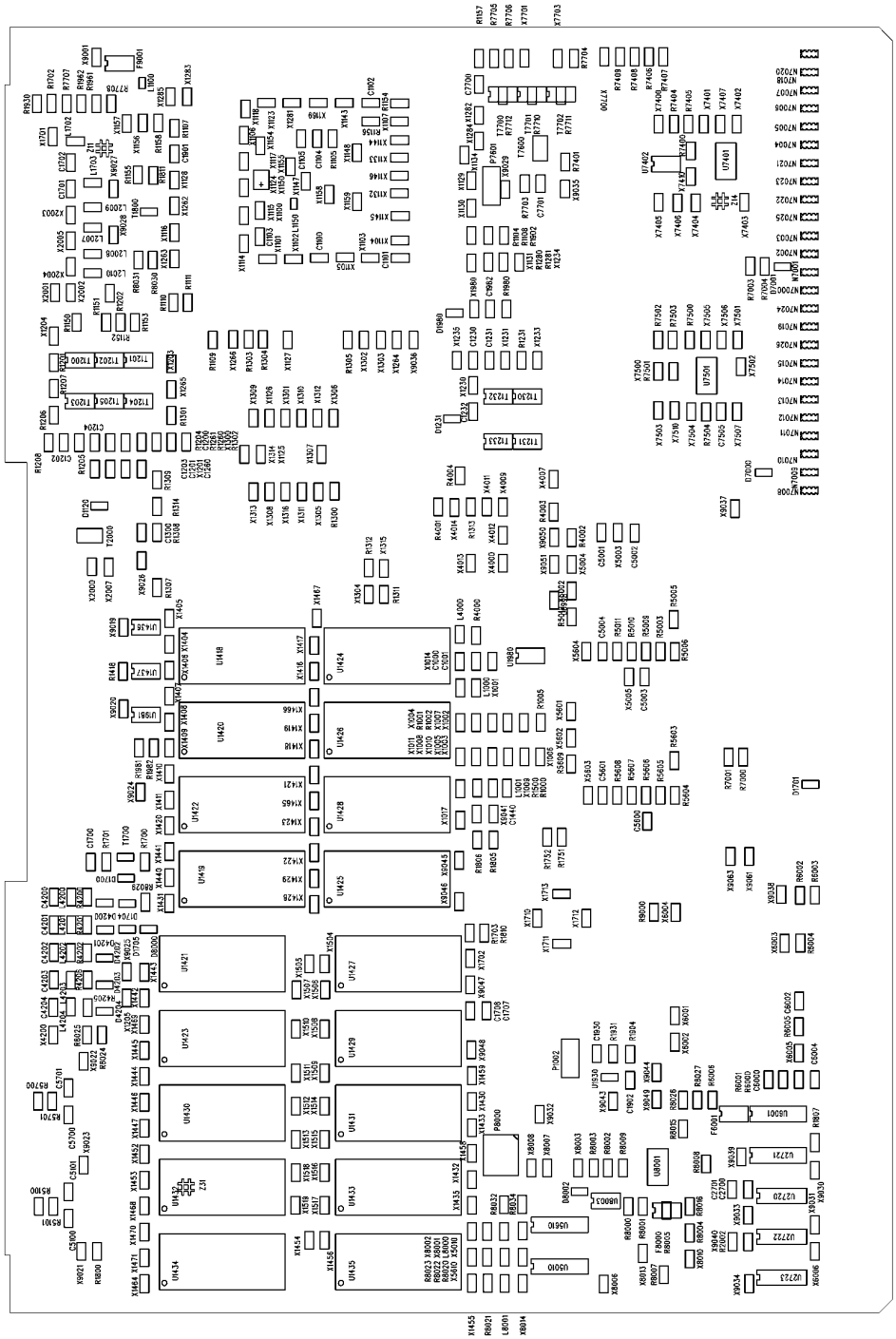
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Placement Plan Placement Plan Component Side CT7 Version 3



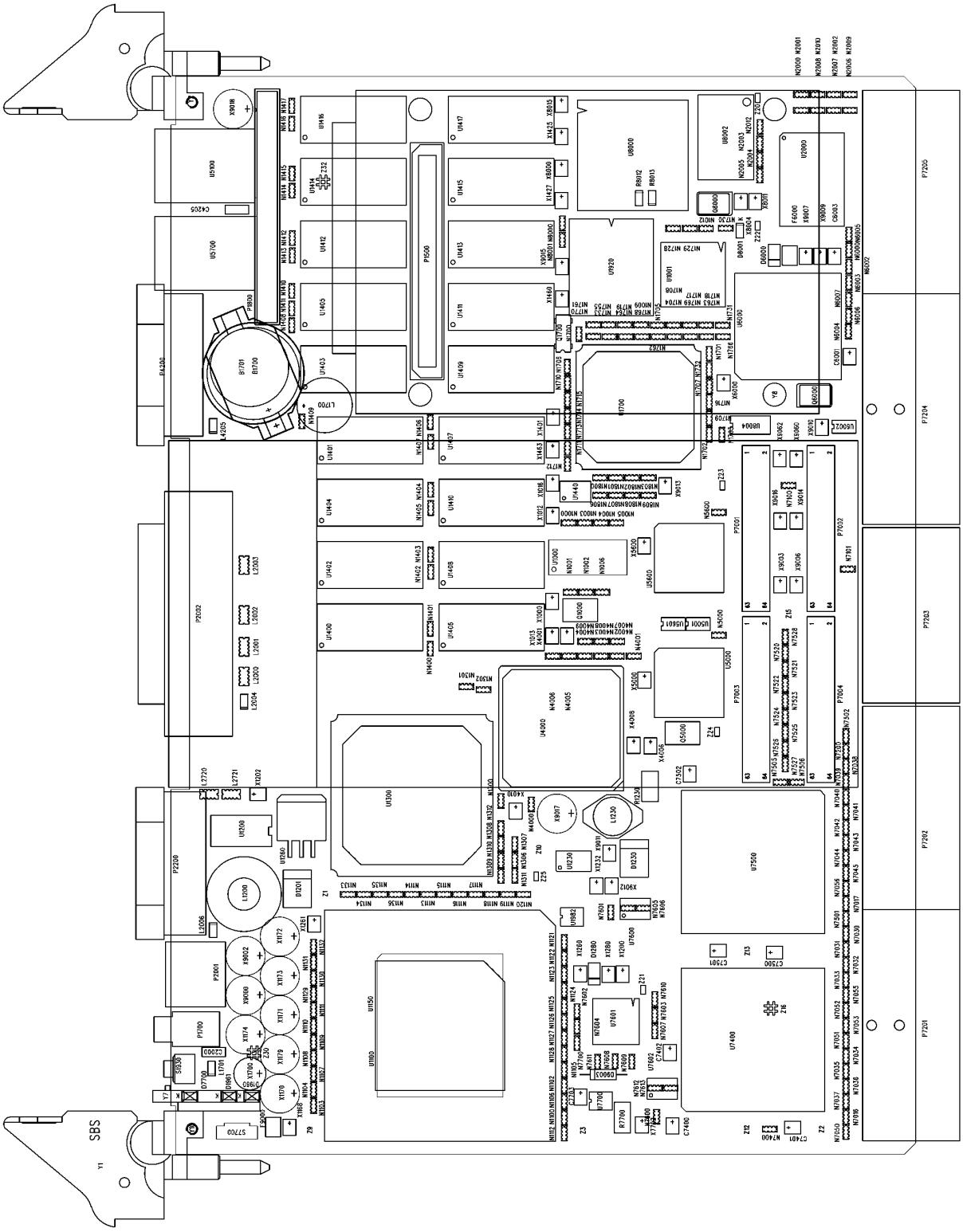
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Placement Plan Solder Side CT7 Version 3



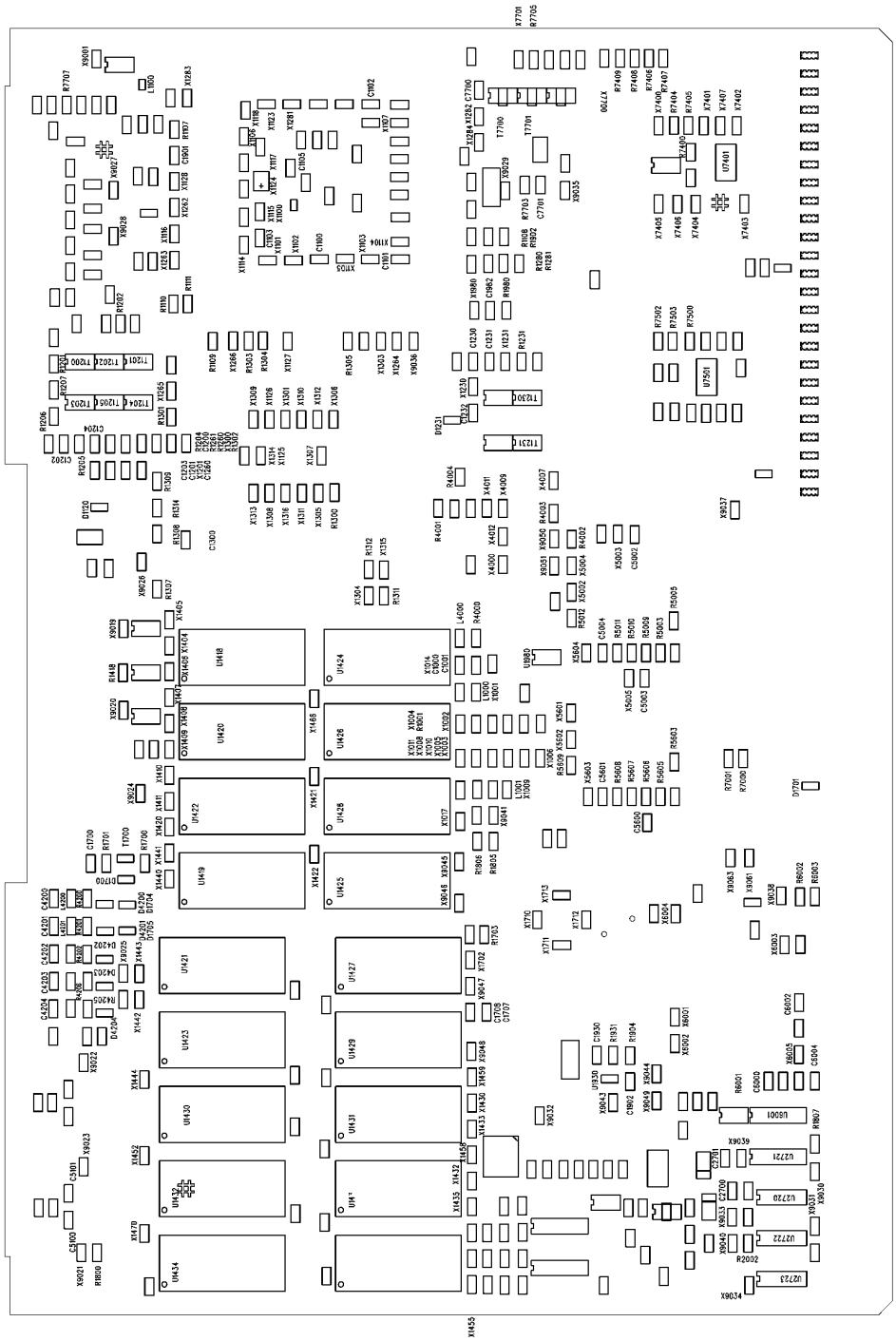
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Placement Plan Component Side CT7 Version 4



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Placement Plan Solder Side CT7 Version 4



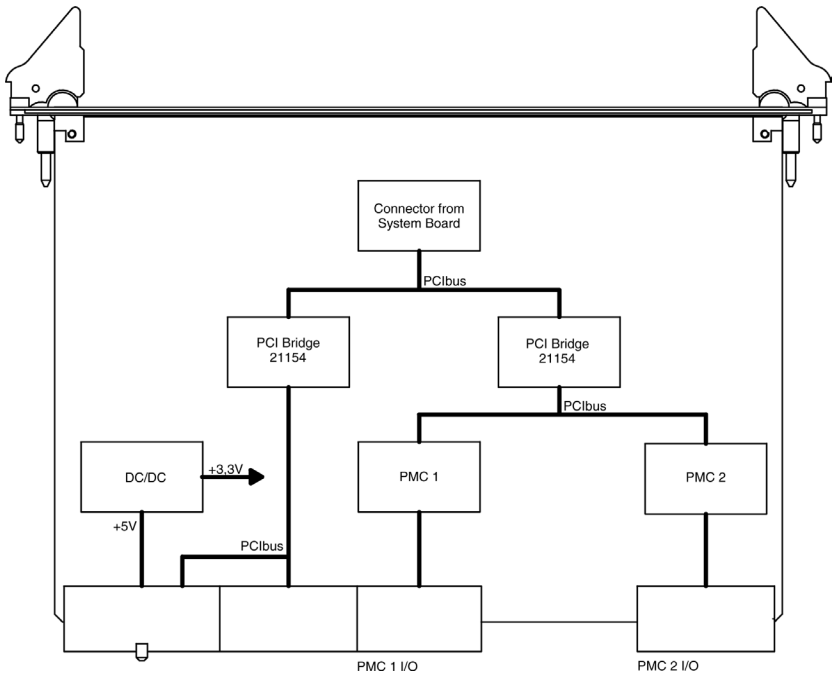
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Appendix A: Extension Board ET7

The 6U ET7 extension board is designed as a PCI extension to the CT7 CompactPCI Single Board Computer. It meets the needs of embedded application developers for more PCI backplane slots and PMC extensions.

The ET7 has two PCI bridges on board. One bridge drives two 64bit PMC slots, the other offers a PCIbus for a second 64bit CompactPCI backplane besides the primary bus at the CT7 system board. This design allows up to 14 PCI slots withput the impact of performance loss of chained PCI bridges.

Please note that the ET7 is an optional accessory sold separately.



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ET7 Connectors

This chapter describes all connector pinouts on the ET7 extension board. Apart from this extension board, the CTM10 transition module and a transition module with mechanical size compliant with IEEE 1101.11-1998 are also available (CT7-TM).

CPCI connector reference

The CPCI specification numbers the CPCI connectors from bottom to top J1, J2, J3, J5. The CPCI connectors on the ET7 are P301, P302, P303, P305 respectively.

Signal groups	Determiner
PMC IO Signals	PMCIO_...
nc	not connected

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CompactPCI P301 and P302

This connector is used for connection to a standard CPCI backplane. The signals shown here form the secondary PCI bus.

P301	A	B	C	D	E	F
1	+5V	-12V	nc	+12V	+5V	GND
2	nc	+5V	nc	nc	nc	GND
3	\INTA	\INTB	\INTC	+5V	\INTD	GND
4	nc	GND	VIO	nc	nc	GND
5	nc	nc	\PCI_RST	GND	\GNT0	GND
6	\REQ0	GND	nc	PCICLK0	AD31	GND
7	AD30	AD29	AD28	GND	AD27	GND
8	AD26	GND	VIO	AD25	AD24	GND
9	\C/BE3	nc	AD23	GND	AD22	GND
10	AD21	GND	nc	AD20	AD19	GND
11	AD18	AD17	AD16	GND	\C/BE2	GND
12-14	KEY	KEY	KEY	KEY	KEY	KEY
15	nc	\FRAME	\IRDY	GND	\TRDY	GND
16	\DEVSEL	GND	VIO	\STOP	\LOCK	GND
17	nc	nc	nc	GND	\PERR	GND
18	\SERR	GND	nc	PAR	\C/BE1	GND
19	nc	AD15	AD14	GND	AD13	GND
20	AD12	GND	VIO	AD11	AD10	GND
21	nc	AD9	AD8	nc	\C/BE0	GND
22	AD7	GND	nc	AD6	AD5	GND
23	nc	AD4	AD3	+5V	AD2	GND
24	AD1	+5V	nc	AD0	\ACK64	GND
25	+5V	\REQ64	\ENUM	nc	+5V	GND

P302	A	B	C	D	E	F
1	PCICLK1	GND	\REQ1	\GNT1	\REQ2	GND
2	PCICLK2	PCICLK3	nc	\GNT2	\REQ3	GND
3	PCICLK4	GND	\GNT3	\REQ4	\GNT4	GND
4	VIO	nc	\C/BE7	GND	\C/BE6	GND
5	\C/BE5	GND	VIO	\C/BE4	PAR64	GND
6	AD63	AD62	AD61	GND	AD60	GND
7	AD59	GND	VIO	AD58	AD57	GND
8	AD56	AD55	AD54	GND	AD53	GND
9	AD52	GND	VIO	AD51	AD50	GND
10	AD49	AD48	AD47	GND	AD46	GND
11	AD45	GND	VIO	AD44	AD43	GND
12	AD42	AD41	AD40	GND	AD39	GND
13	AD38	GND	VIO	AD37	AD36	GND
14	AD35	AD34	AD33	GND	AD32	GND
15	nc	GND	\FAL	\REQ5	\GNT5	GND
16	nc	nc	\DEG	GND	nc	GND
17	nc	GND	nc	\REQ6	\GNT6	GND
18	nc	nc	nc	GND	nc	GND
19	GND	GND	nc	nc	nc	GND
20	PCICLK5	GND	nc	GND	nc	GND
21	PCICLK6	GND	nc	nc	nc	GND
22	nc	nc	nc	nc	nc	GND

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I/O Connector P303 and P305

P303	A	B	C	D	E	F
1	VCC	PMCIO_64	PMCIO_63	PMCIO_62	PMCIO_61	GND
2	PMCIO_60	PMCIO_59	PMCIO_58	PMCIO_57	PMCIO_56	GND
3	PMCIO_55	PMCIO_54	PMCIO_53	PMCIO_52	PMCIO_51	GND
4	PMCIO_50	PMCIO_49	PMCIO_48	PMCIO_47	PMCIO_46	GND
5	PMCIO_45	PMCIO_44	PMCIO_43	PMCIO_42	PMCIO_41	GND
6	PMCIO_40	PMCIO_39	PMCIO_38	PMCIO_37	PMCIO_36	GND
7	PMCIO_35	PMCIO_34	PMCIO_33	PMCIO_32	PMCIO_31	GND
8	PMCIO_30	PMCIO_29	PMCIO_28	PMCIO_27	PMCIO_26	GND
9	PMCIO_25	PMCIO_24	PMCIO_23	PMCIO_22	PMCIO_21	GND
10	PMCIO_20	PMCIO_19	PMCIO_18	PMCIO_17	PMCIO_16	GND
11	PMCIO_15	PMCIO_14	PMCIO_13	PMCIO_12	PMCIO_11	GND
12	PMCIO_10	PMCIO_9	PMCIO_8	PMCIO_7	PMCIO_6	GND
13	PMCIO_5	PMCIO_4	PMCIO_3	PMCIO_2	PMCIO_1	GND
14	VCC3	VCC3	VCC3	VCC	VCC	GND
15	nc	nc	nc	nc	nc	GND
16	nc	nc	nc	nc	nc	GND
17	nc	nc	nc	nc	nc	GND
18	nc	nc	nc	nc	nc	GND
19	nc	nc	nc	nc	nc	GND

P305	A	B	C	D	E	F
1	nc	nc	nc	nc	nc	GND
2	nc	nc	nc	nc	nc	GND
3	nc	nc	nc	nc	nc	GND
4	nc	nc	nc	nc	nc	GND
5	nc	nc	nc	nc	nc	GND
6	nc	nc	nc	nc	nc	GND
7	nc	nc	nc	nc	nc	GND
8	nc	nc	nc	nc	nc	GND
9	nc	nc	nc	nc	nc	GND
10	VCC	PMCIO_64	PMCIO_63	PMCIO_62	PMCIO_61	GND
11	PMCIO_60	PMCIO_59	PMCIO_58	PMCIO_57	PMCIO_56	GND
12	PMCIO_55	PMCIO_54	PMCIO_53	PMCIO_52	PMCIO_51	GND
13	PMCIO_50	PMCIO_49	PMCIO_48	PMCIO_47	PMCIO_46	GND
14	PMCIO_45	PMCIO_44	PMCIO_43	PMCIO_42	PMCIO_41	GND
15	PMCIO_40	PMCIO_39	PMCIO_38	PMCIO_37	PMCIO_36	GND
16	PMCIO_35	PMCIO_34	PMCIO_33	PMCIO_32	PMCIO_31	GND
17	PMCIO_30	PMCIO_29	PMCIO_28	PMCIO_27	PMCIO_26	GND
18	PMCIO_25	PMCIO_24	PMCIO_23	PMCIO_22	PMCIO_21	GND
19	PMCIO_20	PMCIO_19	PMCIO_18	PMCIO_17	PMCIO_16	GND
20	PMCIO_15	PMCIO_14	PMCIO_13	PMCIO_12	PMCIO_11	GND
21	PMCIO_10	PMCIO_9	PMCIO_8	PMCIO_7	PMCIO_6	GND
22	PMCIO_5	PMCIO_4	PMCIO_3	PMCIO_2	PMCIO_1	GND

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PMC Connectors P201, P202, P203, P211, P212, and P213

The following table lists the pin assignments of the PMC connectors for PMC1 and PMC2.

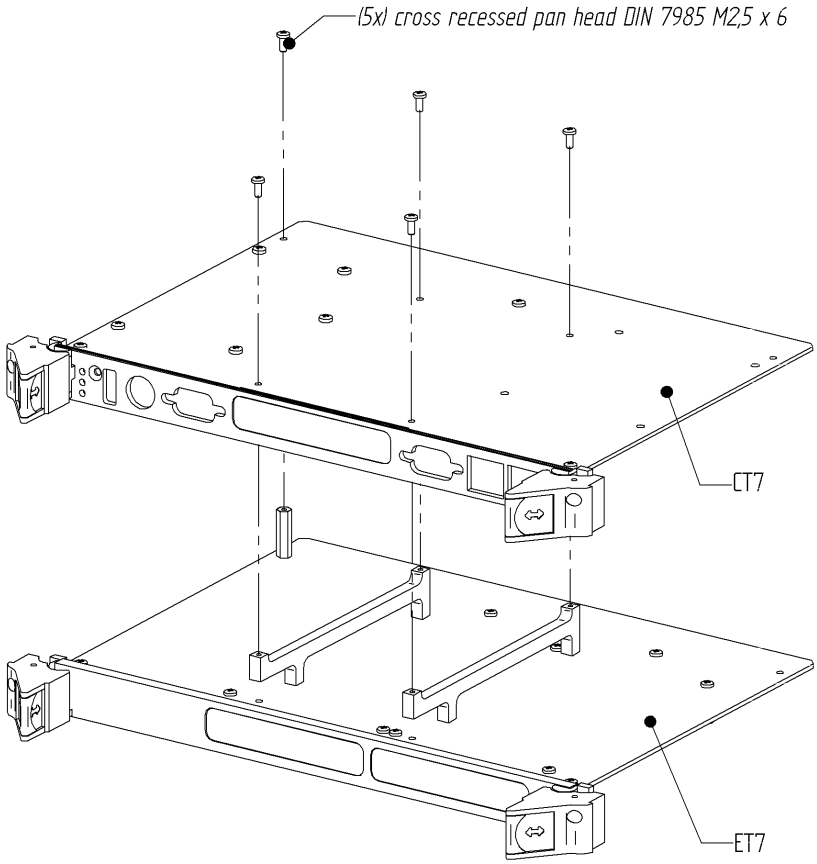
P201 P211	P202 P212	P203 P213	Pin	Pin	P201 P211	P202 P212	P203 P213
nc	+12V	nc	01	02	-12V	nc	GND
GND	nc	GND	03	04	/INTD	nc	C/BE7
/INTA	nc	C/BE6	05	06	/INTB	GND	C/BE5
nc	GND	C/BE4	07	08	VCC	RES.	GND
/INTC	RES.	Vcc	09	10	nc	RES.	PAR64
GND	Vcc	AD63	11	12	nc	+3.3V	AD62
PCLK_PMC	/PCIRST	AD61	13	14	GND	GND	GND
GND	+3.3V	GND	15	16	/GNT0	GND	AD60
/REQ0	RES.	AD59	17	18	VCC	GND	AD58
VCC	AD30	AD57	19	20	AD31	AD29	GND
AD28	GND	Vcc	21	22	AD27	AD26	AD56
AD25	AD24	AD55	23	24	GND	+3.3V	AD54
GND	AD20	AD53	25	26	C/BE3	AD23	GND
AD22	+3.3V	GND	27	28	AD21	AD20	AD52
AD19	AD18	AD51	29	30	VCC	GND	AD50
VCC	AD16	AD49	31	32	AD17	C/BE2	GND
/FRAME	GND	GND	33	34	GND	RES.	AD48
GND	/TRDY	AD47	35	36	/IRDY	+3.3V	AD46
/DEVSEL	GND	AD45	37	38	VCC	/STOP	GND
GND	/PERR	VCC	39	40	/LOCK	GND	AD44
SDONE	+3.3V	AD43	41	42	/SBO	/SERR	AD42
PAR	C/BE1	AD41	43	44	GND	GND	GND
VCC	AD14	GND	45	46	AD15	AD13	AD40
AD12	GND	AD39	47	48	AD11	AD10	AD38
AD9	AD8	AD37	49	50	VCC	+3.3V	GND
GND	AD7	GND	51	52	C/BE0	RES.	AD36
AD6	+3.3V	AD35	53	54	AD5	RES.	AD34
AD4	RES.	AD33	55	56	GND	GND	GND
VCC	nc	Vcc	57	58	AD3	nc	AD32
AD2	GND	nc	59	60	AD1	GND	nc
AD0	/ACK64	nc	61	62	VCC	+3.3V	GND
GND	GND	GND	63	64	/REQ64	RES.	nc

PMC-I/O connector (P204, P214)

Pin 1 of the I/O connector is named PMCIO_01, Pin 2 is PMCIO_02 and so on. All pins of P204 are directly routed to the corresponding pin at P303. The same applies to P214 and P305.

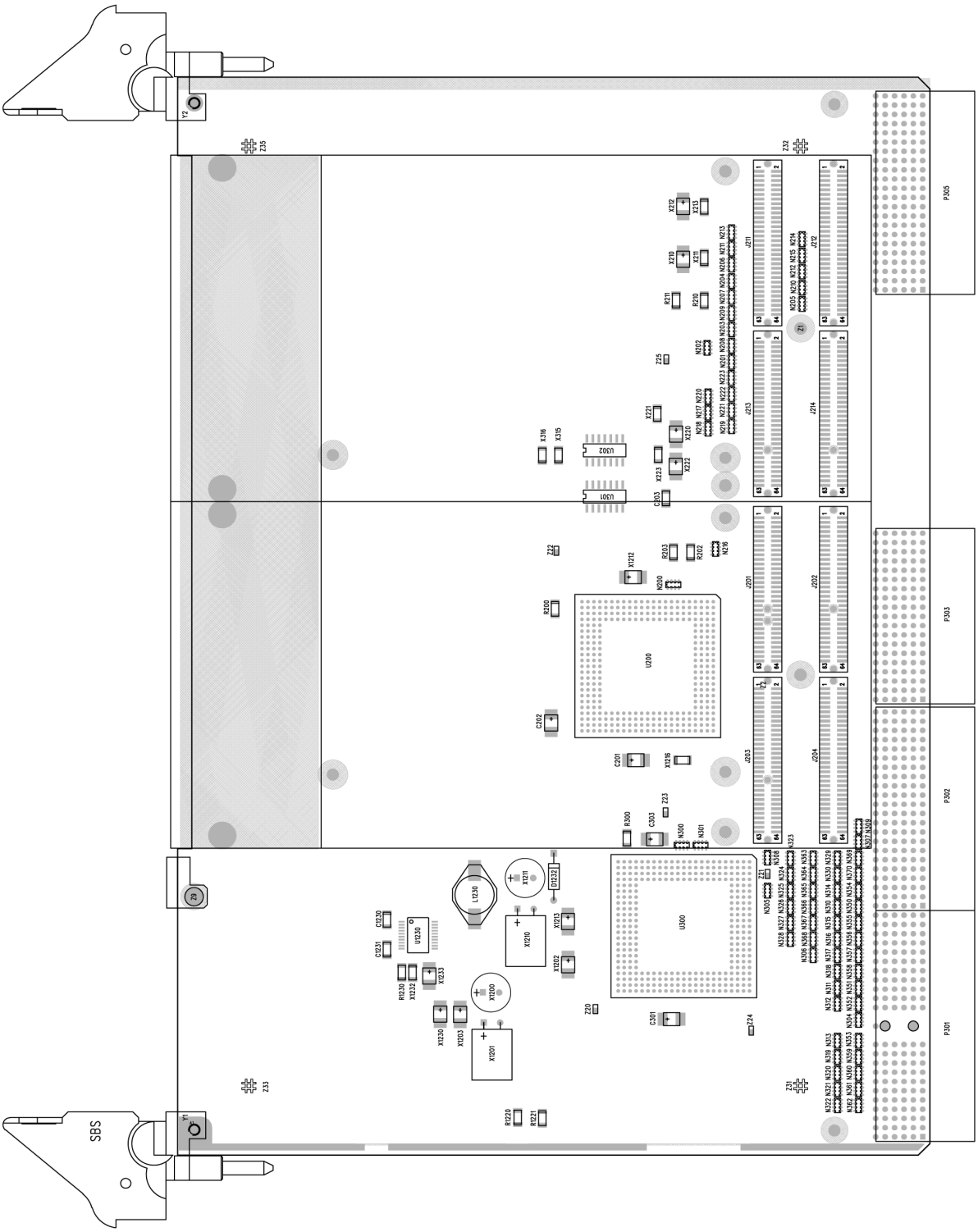
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Assembly ET7 to CT7 Please see the following figure for installation instructions:



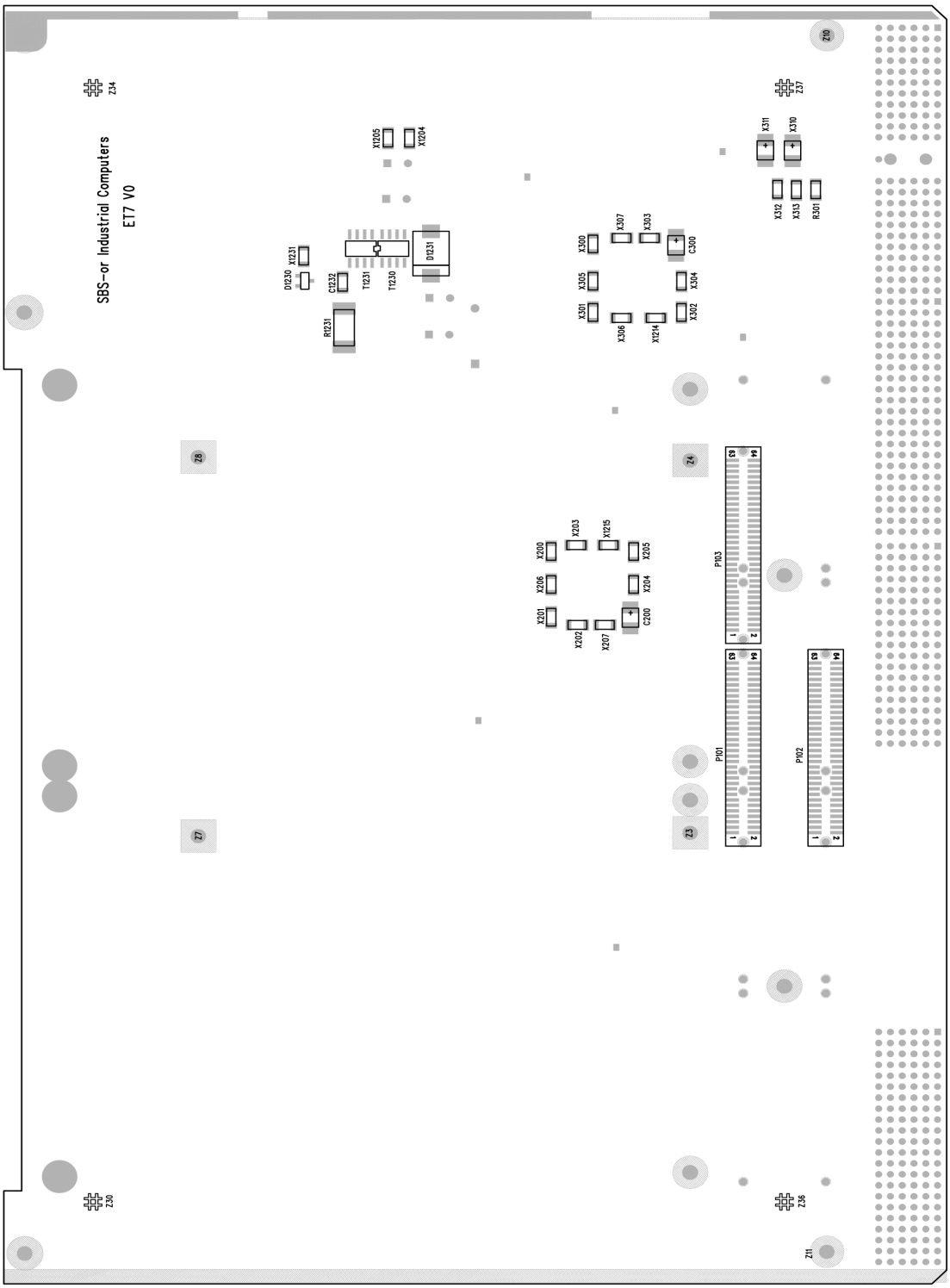
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Placement Plan Placement Plan Component Side



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Placement Plan Solder Side

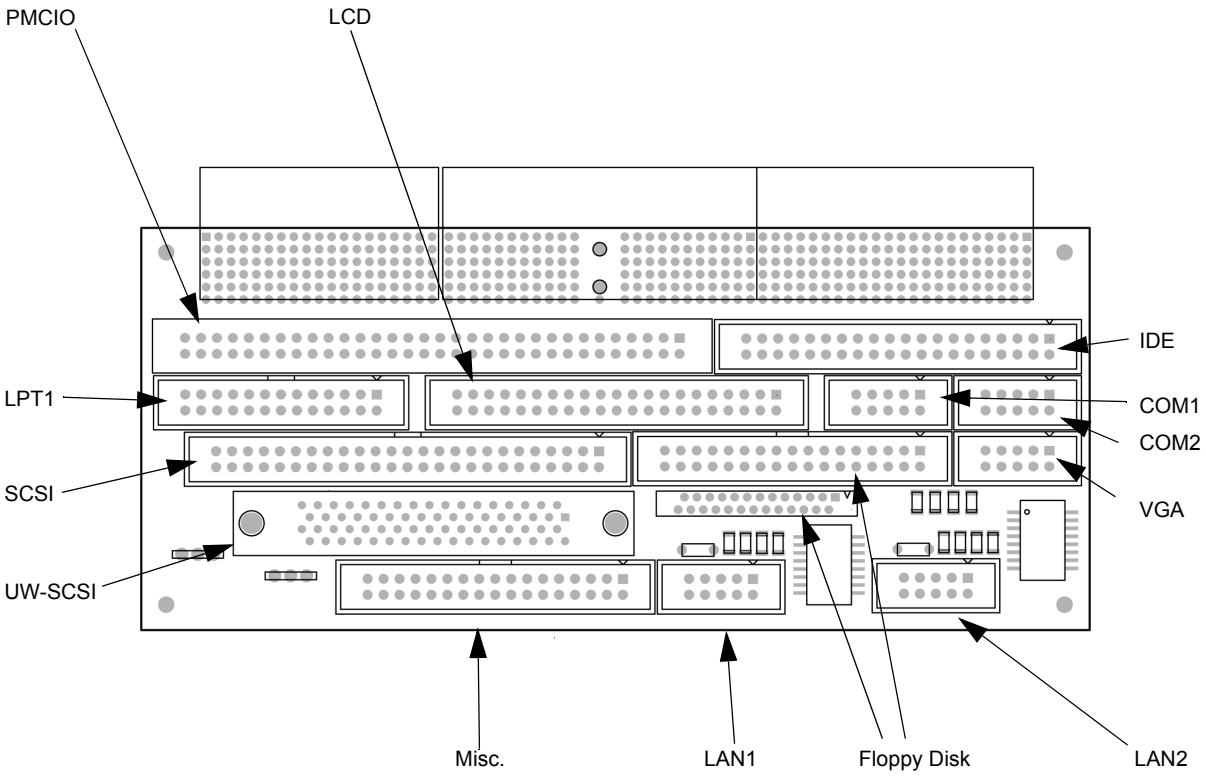


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Appendix B: Transition Module CTM10

The CTM10 transition module is used for easy connection of I/O signals to standard connectors. Additional +5V Power should be provided to the CTM10 via P18/P17 to supply IDE, keyboard, mouse, and floppy disk.

Please refer to the drawing for the location of available interfaces:



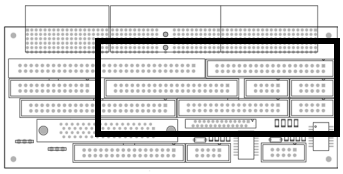
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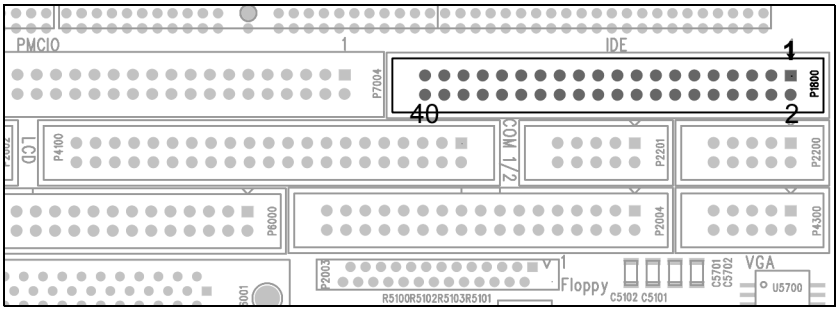
CTM10 Interfaces

This chapter describes all connector pinouts on the CTM10 transition module.

IDE Connector P1800

The IDE interface is designed as a 40-pin 2,54mm pitch male connector to fit directly to one or two external IDE hard drives. The cable length must not exceed 30 cm.



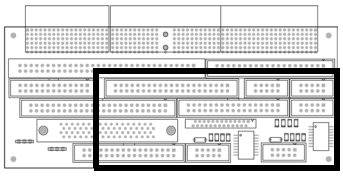


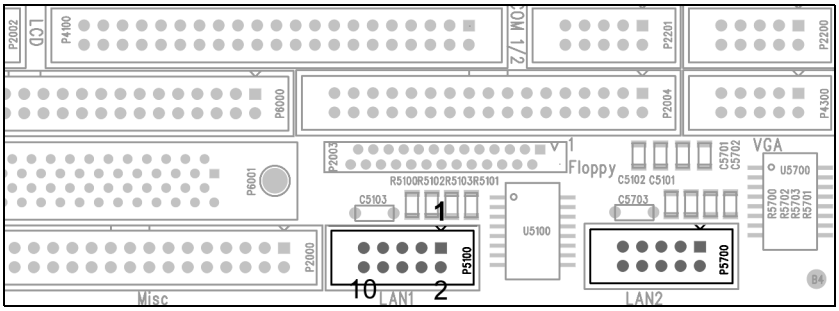
Name	P1800		Name
GND	2	1	\RST_DRV
HD_D8	4	3	HD_D7
HD_D9	6	5	HD_D6
HD_D10	8	7	HD_D5
HD_D11	10	9	HD_D4
HD_D12	12	11	HD_D3
HD_D13	14	13	HD_D2
HD_D14	16	15	HD_D1
HD_D15	18	17	HD_D0
nc	20	19	GND
GND	22	21	HD_DRQ0
GND	24	23	\HD_IOW
GND	26	25	\HD_IOR
nc	28	27	HD_RDY
GND	30	29	HD_DAK0
nc	32	31	HD_IRQ
nc	34	33	HD_A1
HD_A2	36	35	HD_A0
\HD_CS3	38	37	\HD_CS1
GND	40	39	nc
+5V			+5V
nc			GND

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Ethernet Interface 10BaseT and 100BaseTX P5100 and P5700

The Ethernet interfaces for Rear-IO requires usage of CAT 5 cable which contains separate transmit and receive pairs for proper operation with 100BaseTX. For operation with 10BaseT, a CAT 3 cable or better is required. The Ethernet output (Front or Rear) is software selectable for each Channel.



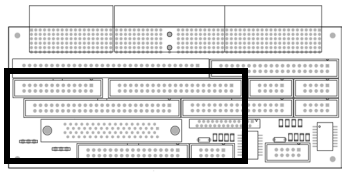


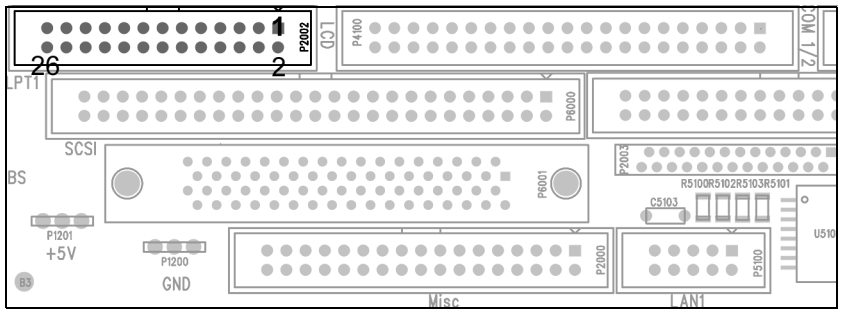
Name	Ethernet1 P5100 and Ethernet2 P5700
TXD+ (RJ1)	1
TXD- (RJ2)	2
RXD+ (RJ3)	5
BIAS1 (RJ4)	3
BIAS1 (RJ5)	4
RXD- (RJ6)	6
BIAS2 (RJ7)	7
BIAS2 (RJ8)	8
FGND	9,10

Note: BIAS1 and BIAS2 are connected via a resistor bridge to the center tabs of the input and output transformers.

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Parallel Interface LPT1 P2002





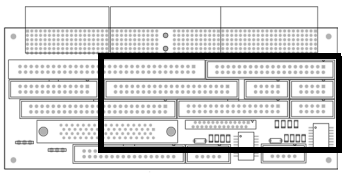
Name	P2002
\Strobe	1
D0	3
D1	5
D2	7
D3	9
D4	11
D5	13
D6	15
D7	17
\ACK	19
BUSY	21
PE	23
SLCT	25
\AUTOFEED	2
\ERROR	4
\INIT	6
\SLCTIN	8
GND	10,12,14,16,18,20,22,24
+5V unfused [a]	26

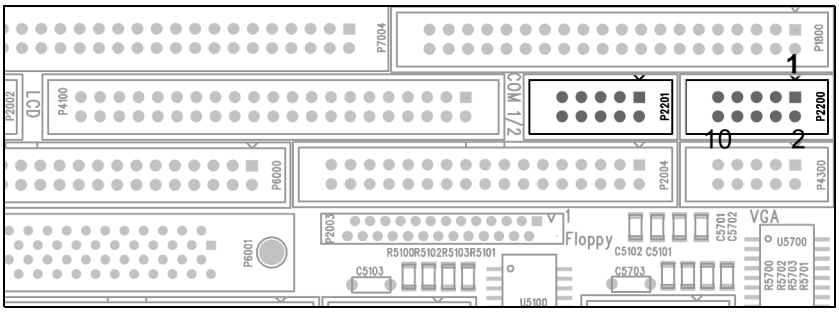
a. +5V supply via CTM10

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Serial Interfaces COM1 P2200 and COM2 P2201

The CT7 offers two RS232 serial ports. All COM ports are accessible via the transition module.





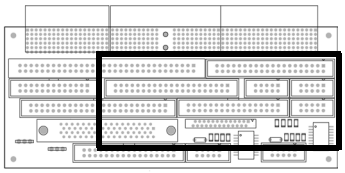
Name	COM1 P2200 and COM2 P2201
\DCD	1
\DSR	2
RXD	3
\RTS	4
TXD	5
\CTS	6
\DTR	7
\RI	8
GND	9
+5V unfused [a]	10

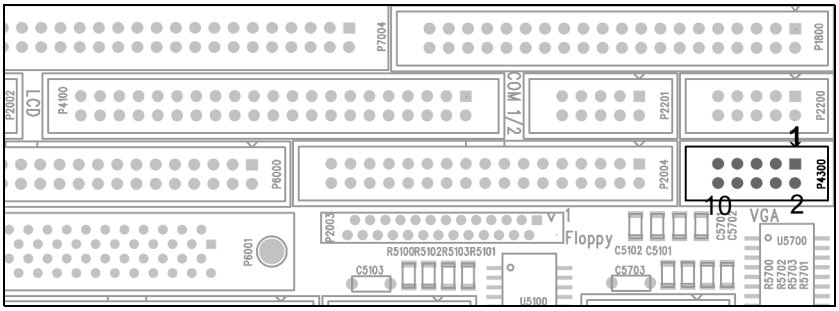
a. +5V supply via CTM10

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VGA Interface P4300

The monitor signals are available on P4300.





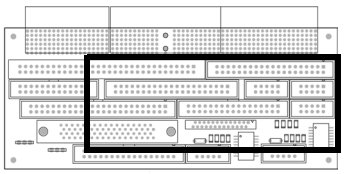
Name	P4300
RED	2
GREEN	4
BLUE	6
HSYNC	8
VSYNC	10
DDC-Data	n.a.
DDC-Clock	n.a.
Fused +5V	n.a.
GND	1, 3, 5, 7, 9
nc	-

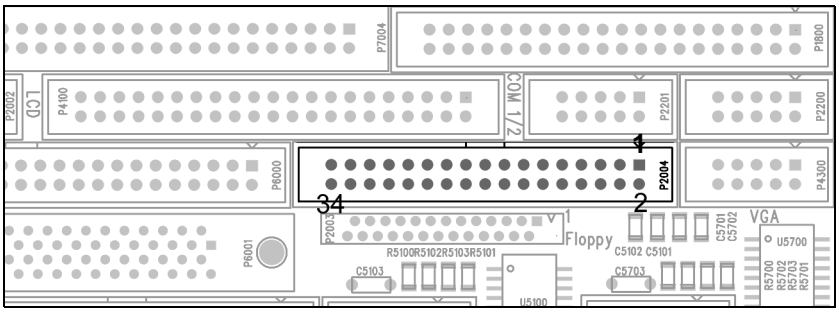
n.a. not available

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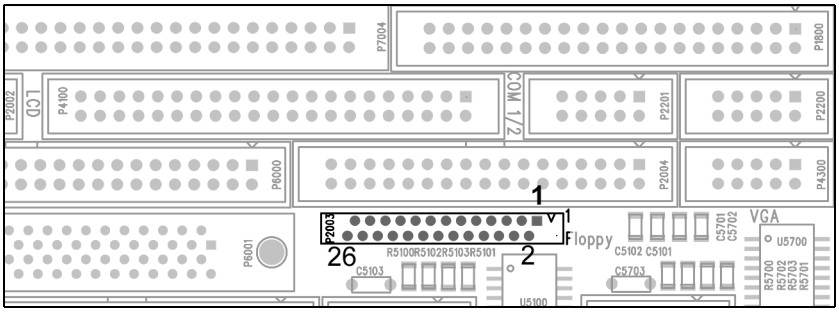
Floppy connector P2003/2004

The CTM10 provides a connector for direct adaptation of a floppy drive via a standard 2.54 mm 34-pin connector:





Alternatively, you can use a 26-pin foil cable connector:



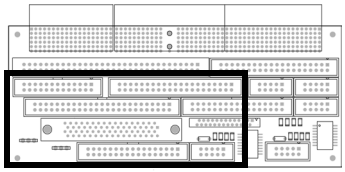
Name	P2003	P2004
\INDEX	2	8
\DRVSEL	4	12
\DSKCHG	6	34
\MOTOR	10	16
\DIR	12	18
\STEP	14	20
\WRDATA	16	22
\WGATE	18	24
\TRACK0	20	26
\WRPROT	22	28
\RDDATA	24	30
\HDSEL	26	32
GND	15, 17, 19, 21, 23, 25	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33
+5V unfused [a]	1, 3, 5	-
nc	7, 8, 9, 11, 13	2, 4, 6, 10, 14

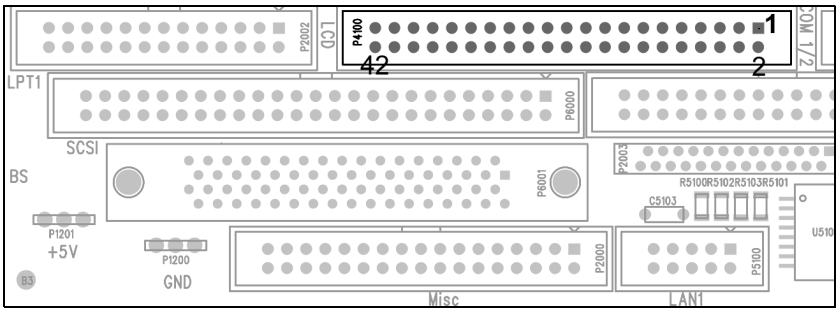
a. +5V supply via CTM10

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LCD/Panel connector P4100

A 42-pin header is mounted on the transition module to be used with LCD displays or for the connection to our external panel 'LCD1'. The high level of all LCD signals is 3.3V.





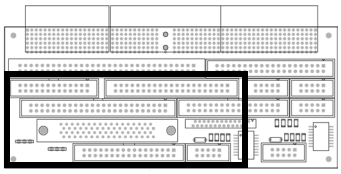
Name	P4100		Name
COM2-TXD	1	2	COM2-RXD
KBCLK	3	4	KBDAT
enableVCC	5	6	enableVEE
BACKL	7	8	DE
GND	9	10	P16
P04	11	12	P03
P02	13	14	P01
P00	15	16	GND
P10	17	18	P09
P08	19	20	P07
P06	21	22	P05
GND	23	24	P17
P15	25	26	P14
P13	27	28	P12
P11	29	30	GND
VSYNC	31	32	HSYNC
CLK	33	34	GND
P18	35	36	P19
P20	37	38	P21
P22	39	40	P23

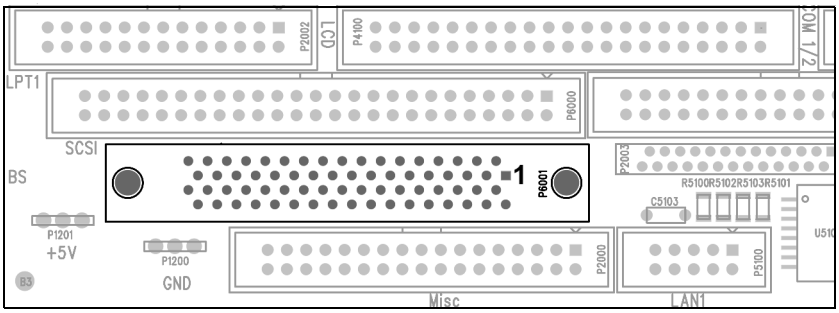
For the function of the signals P00...P23 please see chapter “LCD Signal Mapping” on page 40.

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Ultra Wide SCSI connector P6001

The UltraWide SCSI interface is a standard 16-bit SCSI 68 pin connector.





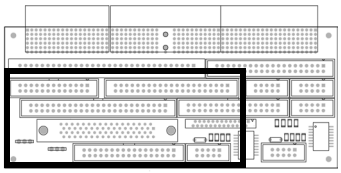
Name	P6001		Name
\D12	35	1	GND
\D13	36	2	GND
\D14	37	3	GND
\D15	38	4	GND
\DP1	39	5	GND
\D0	40	6	GND
\D1	41	7	GND
\D2	42	8	GND
\D3	43	9	GND
\D4	44	10	GND
\D5	45	11	GND
\D6	46	12	GND
\D7	47	13	GND
\DP0	48	14	GND
GND	49	15	GND
GND	50	16	GND
TERMPWR [a]	51	17	TERMPWR [a]
TERMPWR [a]	52	18	TERMPWR [a]
nc	53	19	nc
GND	54	20	GND
\ATN	55	21	GND
GND	56	22	GND
\BUSY	57	23	GND
\ACK	58	24	GND
\RST	59	25	GND
\MSG	60	26	GND
\SEL	61	27	GND
\C/D	62	28	GND
\REQ	63	29	GND
\IO	64	30	GND
\D8	65	31	GND
\D9	66	32	GND
\D10	67	33	GND
\D11	68	34	GND

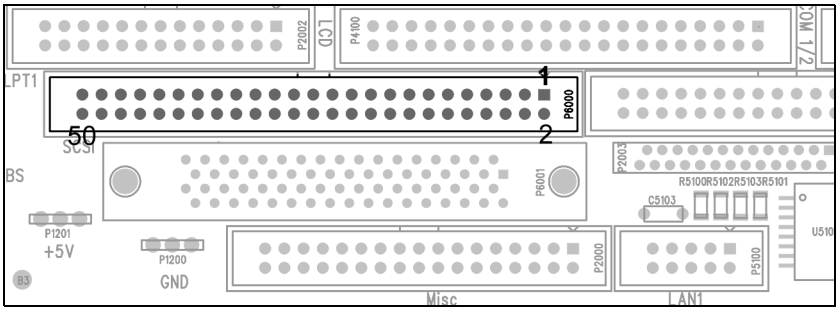
a. Termination voltage from CT7

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SCSI connector P6000

This SCSI interface is a standard 8-bit SCSI 50 pin connector.





Name	P6000		Name
\D0	2	1	GND
\D1	4	3	GND
\D2	6	5	GND
\D3	8	7	GND
\D4	10	9	GND
\D5	12	11	GND
\D6	14	13	GND
\D7	16	15	GND
\DP	18	17	GND
GND	20	19	GND
GND	22	21	GND
nc	24	23	nc
TERMPWR [a]	26	25	nc
nc	28	27	nc
GND	30	29	GND
\ATN	32	31	GND
GND	34	33	GND
\BUSY	36	35	GND
\ACK	38	37	GND
\RST	40	39	GND
\MSG	42	41	GND
\SEL	44	43	GND
\C/D	46	45	GND
\REQ	48	47	GND
\IO	50	49	GND

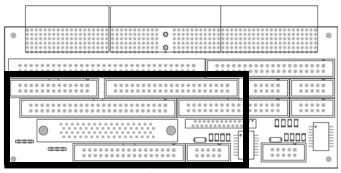
a. Termination voltage from CT7

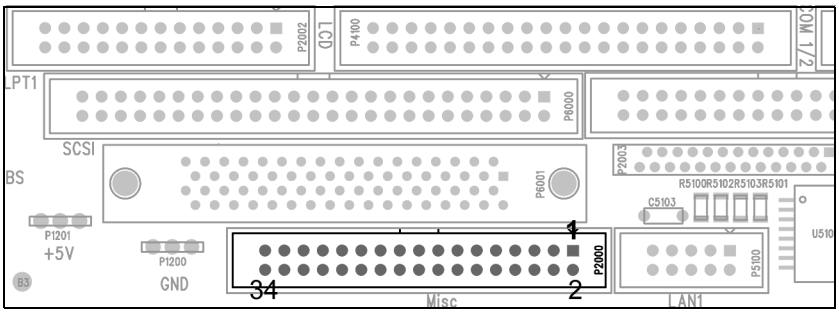
PMC-I/O connector P7400

Pin 1 of the I/O connector is GPIO1, Pin 2 is GPIO2 and so on. No traces are connected to any signal onboard.

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Misc. connector P2000



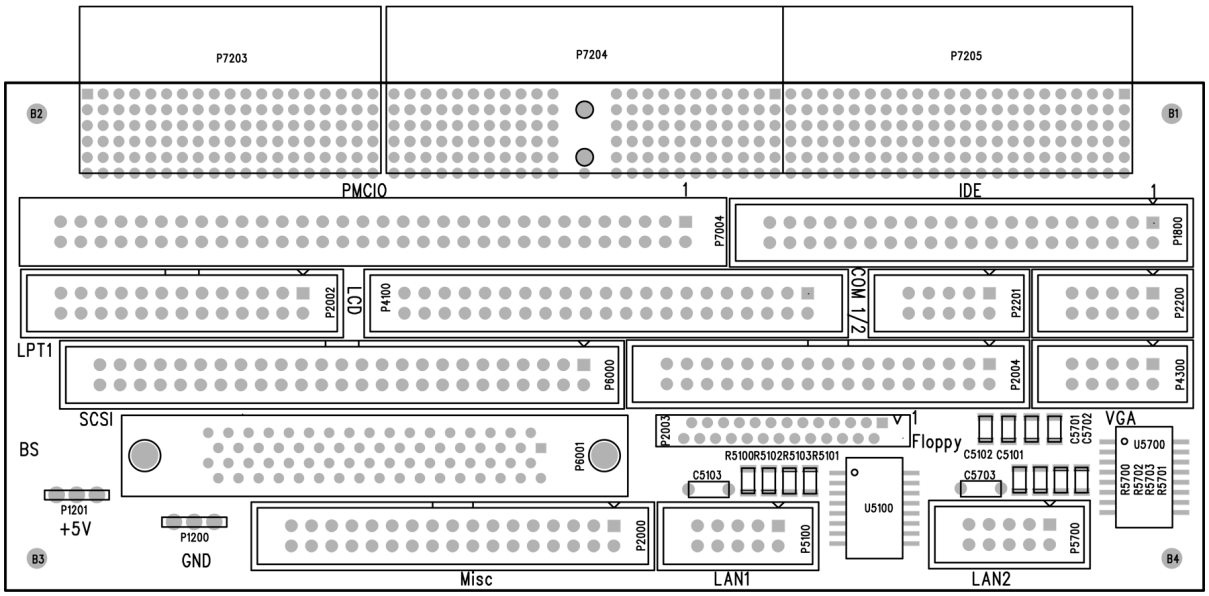


Name	P2000		Name
nc	1	2	nc
nc	3	4	nc
GND	5	6	\RST_BUT
+5V unfused [a]	7	8	\SPEAKER
+5V unfused [a]	9	10	\WDG_REL
+5V unfused [a]	11	12	\LED
+5V unfused [a]	13	14	MOUSE_CLK
GND	15	16	MOUSE_DAT
+5V unfused [a]	17	18	KBD_CLK
GND	19	20	KBD_DATA
+5V unfused [a]	21	22	USB1-
USB1+	23	24	USB2-
USB2+	25	26	GND
GND	27	28	VBATIN [b]
nc	29	30	VIO [c]

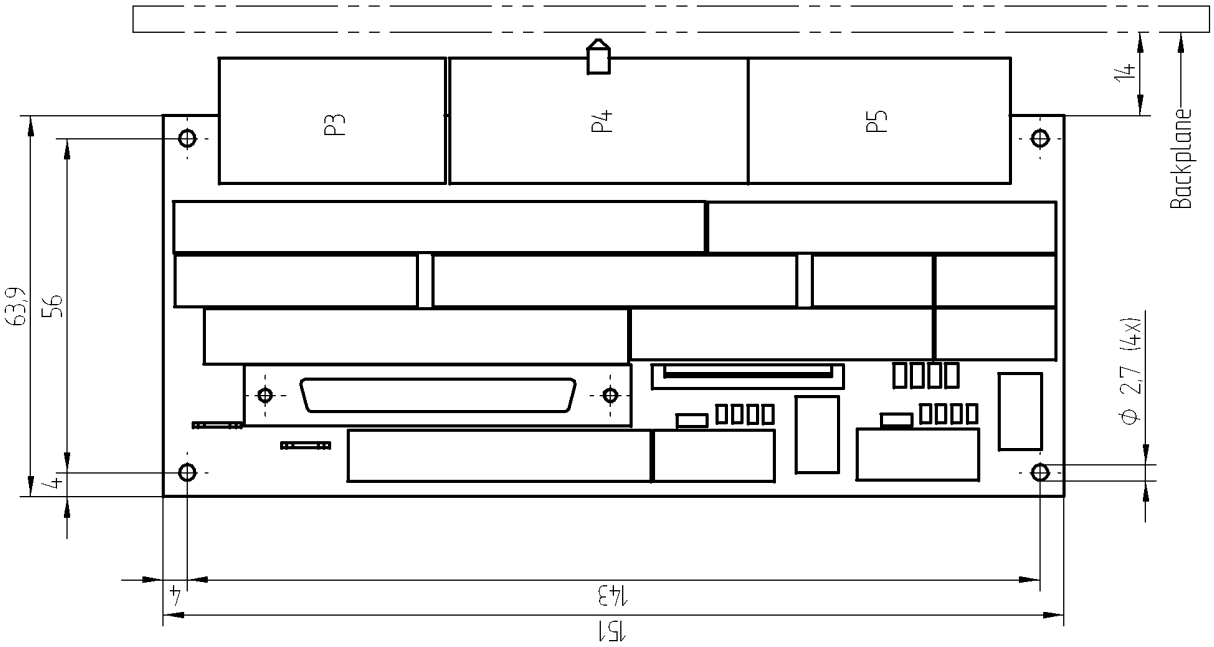
a. +5V supply via CTM10
b. VBATIN is used to connect an external battery to CT7
c. VIO is the I/O voltage of the PMC slot and is connected to +5V on the CT

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Placement Plan



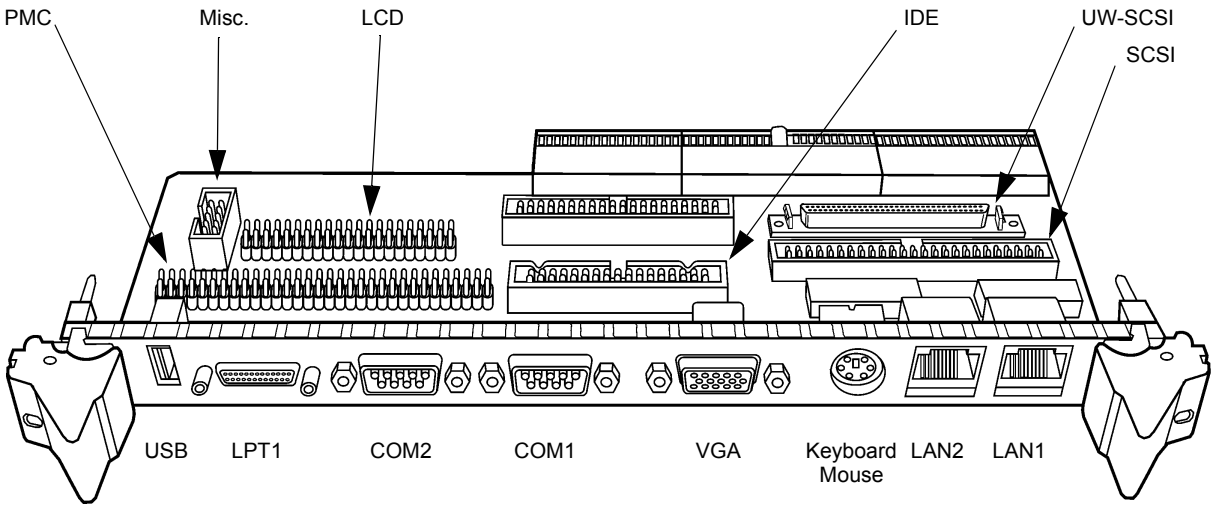
Mechanical Data



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Appendix C: Transition Module CT7-TM

The CT7-TM is a transition module which is used to route I/O signals from the CT7 Pentium PC/AT Compatible 6U CompactPCI® Single Board Computer with HotSwap to both front panel and onboard connectors for interface to external peripherals.



The module is a 6U x 80mm rear I/O module which has to be plugged into the CT7 with the backplane between. It has a video connector which is fully compatible with the VGA standard connector and pinout. Plug your video monitor into this connector. Make sure that your selected chassis supports this type of rear I/O transition module.

The CT7-TM transition module is compliant with IEEE 1101.11-1998.

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The CT7 Single Board Computer has two Ethernet LAN ports routed to both the front and the rear. Additionally, a SCSI, an UltraWide SCSI and IDE interface are routed to the rear of the card. The signals of these interfaces can be routed to the CT7-TM transition module. Only passive components are used, including the two LAN transformers.

The availability of the secondary IDE interface of the transition module and the SCSI connectors are mutually exclusive.

Please note that no power connectors are available on the transition module for external peripherals.

The following sections describe the functions and interfaces in detail.

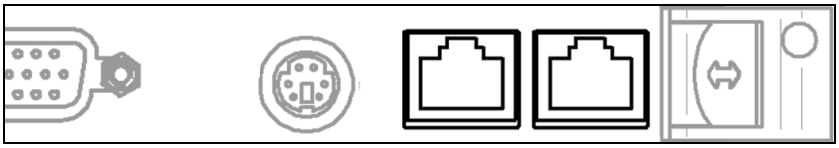
CT7-TM Interfaces

This chapter describes connector pinouts on the CT7-TM transition module. The following connectors are available on this module:

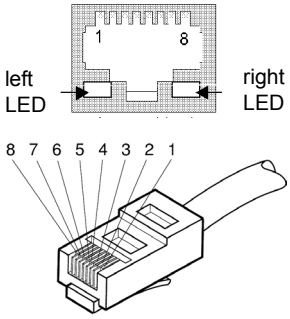
- Transition nodule front panel connectors
  - Two Ethernet RJ45 connectors
  - Mini DIN for Keyboard/Mouse combo
  - Two full-size 9-Pin Dsub connectors
  - One USB Port
  - Full-size 15-Pin Dsub VGA connector
  - LPT connector in mini 25-Pin format
- Transition module onboard connectors
  - IDE
  - 68-Pin SCSI connector
  - 50-Pin SCSI connector
  - 34-Pin Floppy connector
  - 42-Pin LCD connector
  - 64-Pin PMC IO connector
  - 10-Pin Misc. connector

Ethernet RJ1 and RJ2

Two RJ45 Ethernet connectors are mounted the the transition module's front panel.



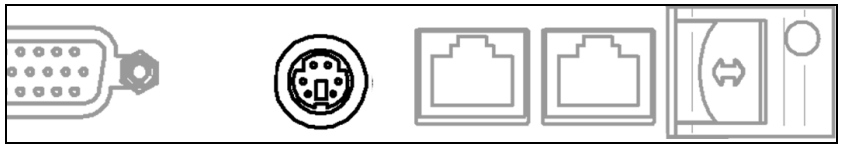
Name	Ethernet1 and Ethernet2
TXD+ (RJ1)	1
TXD- (RJ2)	2
RXD+ (RJ3)	3
BIAS1 (RJ4)	4
BIAS1 (RJ5)	5
RXD- (RJ6)	6
BIAS2 (RJ7)	7
BIAS2 (RJ8)	8
FGND	



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Keyboard / Mouse J6

The keyboard/mouse interface consists of six electrical connections provided on a 6-pin circular mini-DIN connector (PS/2-style). Two terminal connections are for communication between the keyboard and the keyboard interface port. Two similar connections are for communication between the mouse and the mouse interface port. All four of these signals are CMOS compatible. The two remaining connections provide power for mouse and keyboard operation.



Pin	Signal	Function
1	KDATA	Bidirectional serial data to/from keyboard
2	MDATA	Bidirectional serial data to/from mouse
3	GND	Digital Ground (0 volt) reference to keyboard
4	FVCC	+5 volt power to the keyboard
5	KBCLK	Bidirectional data clock to/from keyboard
6	MSCLK	Bidirectional data clock to/from mouse

VGA J9

Monitor signals are available at the front panel on a standard 15-pin female D-Sub connector.

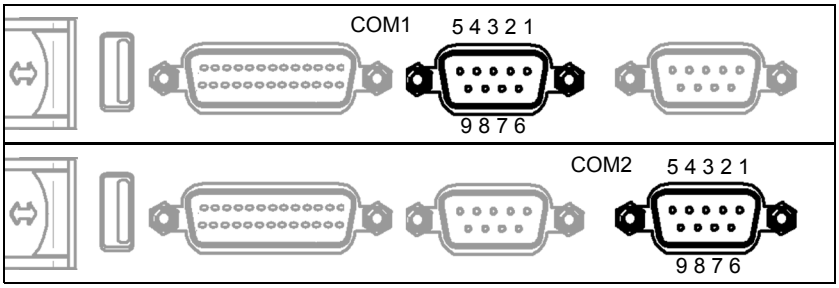


Pin	Signal	Pin	Signal
1	RED	9	NC
2	GRN	10	GND
3	BLU	11	NC
4	NC	12	NC
5	GND	13	RHSYNC
6	GND	14	RVSYNC
7	GND	15	NC
8	GND		

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COM1 J7 and COM2 J8

The two serial ports terminate into two full sized 9-Pin D-Sub connectors mounted on the front panel.

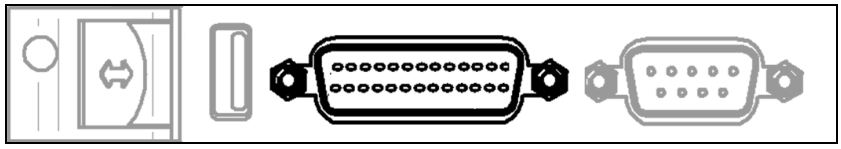


Pin	Signal	Function
1	#DCD	Data carrier detect (low active)
2	RXD	Receive data
3	TXD	Transmit data
4	#DTR	Data terminal ready (low active)
5	GND	Ground
6	#DSR	Digital signal ready (low active)
7	#RTS	Ready to send (low active)
8	#CTS	Clear to send (low active)
9	RI	Ring Indicator

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LPT1 J10

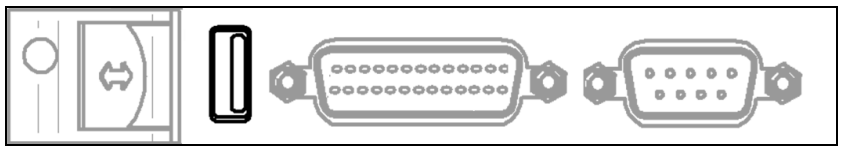
A 25-pin parallel port male connector is available at the front panel to connect a printer using a standard centronics cable.



Pin	Signal	Pin	Signal
1	L1_STRQ/	14	L1_AFED/
2	L1_D0	15	L1_ERRO/
3	L1_D1	16	L1_INIT/
4	L1_D2	17	L1_SLIN/
5	L1_D3	18	GND
6	L1_D4	19	GND
7	L1_D5	20	GND
8	L1_D6	21	GND
9	L1_D7	22	GND
10	L1_ACK/	23	GND
11	L1_BUSY	24	GND
12	L1_PE	25	GND
13	L1_SLCT		

USB J11

One USB channel is available at the front panel.

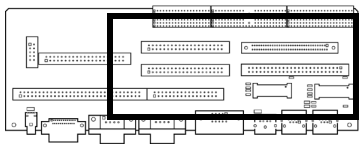


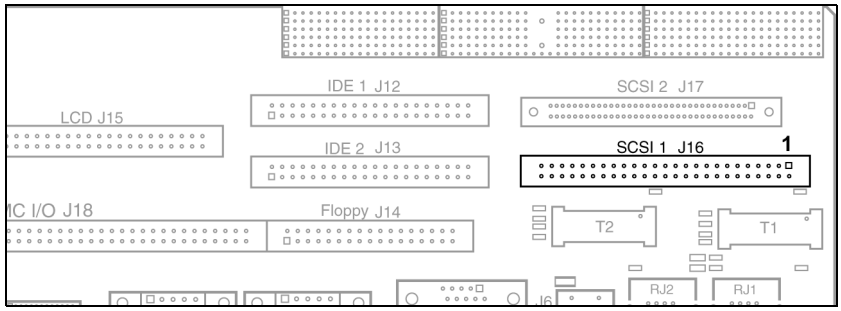
Pin	Signal
1	VCC
2	USB0-
3	USB0+
4	GND

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SCSI J16

This SCSI interface is a standard 8-bit SCSI 50 pin connector.



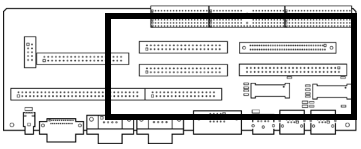


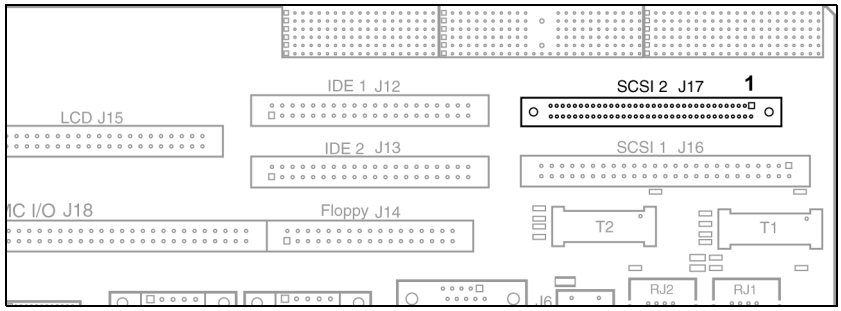
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	11	GND	21	GND	31	GND	41	GND
2	#D0	12	#D5	22	GND	32	#ATN	42	#MSG
3	GND	13	GND	23	NC	33	GND	43	GND
4	#D1	14	#D6	24	NC	34	GND	44	#SEL
5	GND	15	GND	25	NC	35	GND	45	GND
6	#D2	16	#D7	26	TPWR	36	#BUSY	46	#C/D
7	GND	17	GND	27	NC	37	GND	47	GND
8	#D3	18	#DP	28	NC	38	#ACK	48	#REQ
9	GND	19	GND	29	GND	39	GND	49	GND
10	#D4	20	GND	30	GND	40	#RST	50	#IO

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UW-SCSI J17

The UltraWide SCSI interface is a standard 16-bit SCSI 68 pin connector.



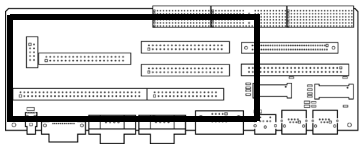


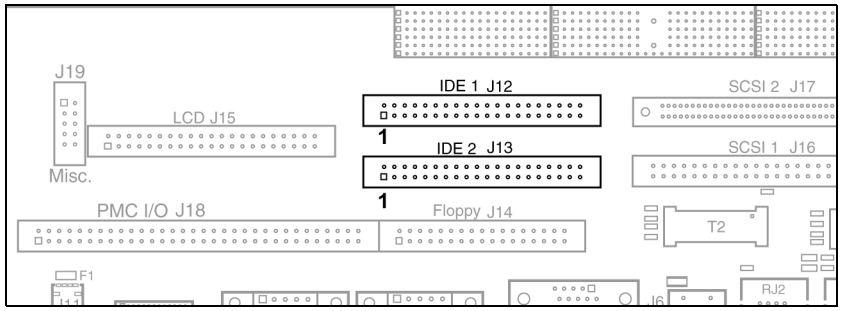
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	18	TPWR	35	#D12	52	TPWR
2	GND	19	GND	36	#D13	53	NC
3	GND	20	GND	37	#D14	54	GND
4	GND	21	GND	38	#D15	55	#ATN
5	GND	22	GND	39	#DP1	56	GND
6	GND	23	GND	40	#D0	57	#BUSY
7	GND	24	GND	41	#D1	58	#ACK
8	GND	25	GND	42	#D2	59	#RST
9	GND	26	GND	43	#D3	60	#MSG
10	GND	27	GND	44	#D4	61	#SEL
11	GND	28	GND	45	#D5	62	#C/D
12	GND	29	GND	46	#D6	63	#REQ
13	GND	30	GND	47	#D7	64	#IO
14	GND	31	GND	48	#DP0	65	#D8
15	GND	32	GND	49	GND	66	#D9
16	GND	33	GND	50	GND	67	#D10
17	TPWR	34	GND	51	TPWR	68	#D11

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IDE J12

The IDE1 interface is a regular 40-pin male connector.



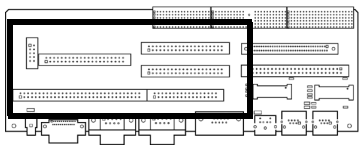


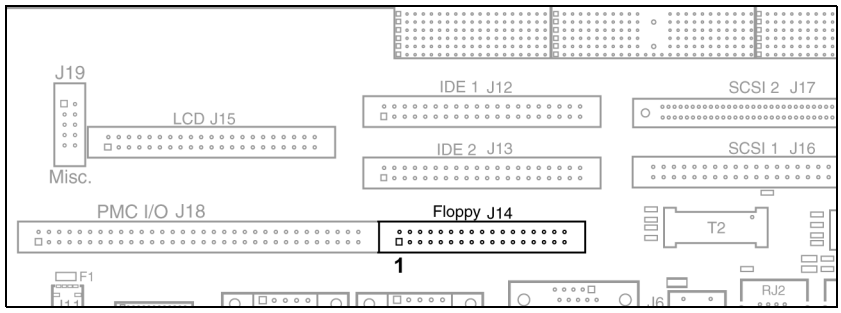
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	HDX_RST	11	HDX_D3	21	HDX_DRQ	31	HDX_IRQ
2	GND	12	HDX_D12	22	GND	32	NC
3	HDX_D7	13	HDX_D2	23	HDX_IOW	33	HDX_A1
4	HDX_D8	14	HDX_D13	24	GND	34	PDIAG
5	HDX_D6	15	HDX_D1	25	HDX_IOR	35	HDX_A0
6	HDX_D9	16	HDX_D14	26	GND	36	HDX_A2
7	HDX_D5	17	HDX_D00	27	HDX_RDY	37	HDX_CS1
8	HDX_D10	18	HDX_D15	28	HDX_SPSYNC	38	HDX_CS3
9	HDX_D4	19	GND	29	HDX_DAK	39	HDX_DASP
10	HDX_D11	20	NC	30	GND	40	GND

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Floppy Disk Drive J14

The CT7TM features a connector for direct adaptation of a floppy drive via a standard 2.54 mm 34-pin connector



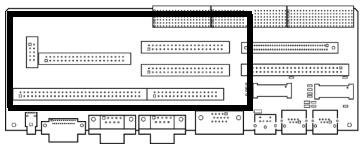


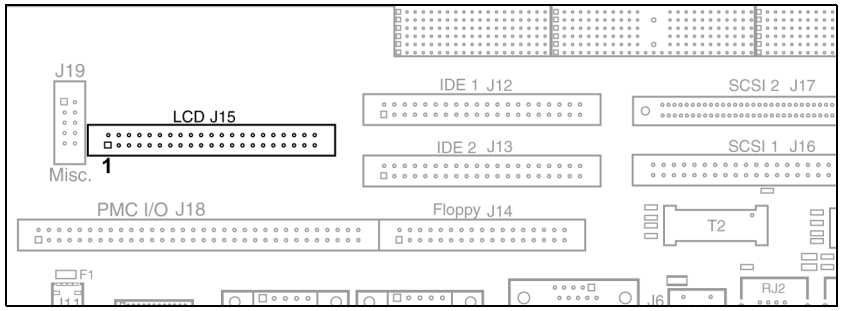
Pin	Signal	Pin	Signal
1	GND	18	#DIR
2	NC	19	GND
3	GND	20	#STEP
4	NC	21	GND
5	GND	22	#WRDATA
6	NC	23	GND
7	GND	24	#WGATE
8	#INDEX	25	GND
9	GND	26	#TRACK0
10	NC	27	GND
11	GND	28	#WRPROT
12	#DRVSEL	29	GND
13	GND	30	#RDDATA
14	NC	31	GND
15	GND	32	HDSEL
16	#MOTOR	33	GND
17	GND	34	#DSKCHG

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LCD J15

The flat panel (LCD) interface is a 2-row, 42-pin male connector.



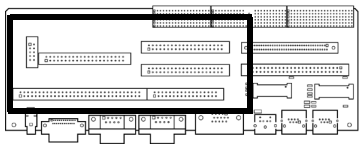


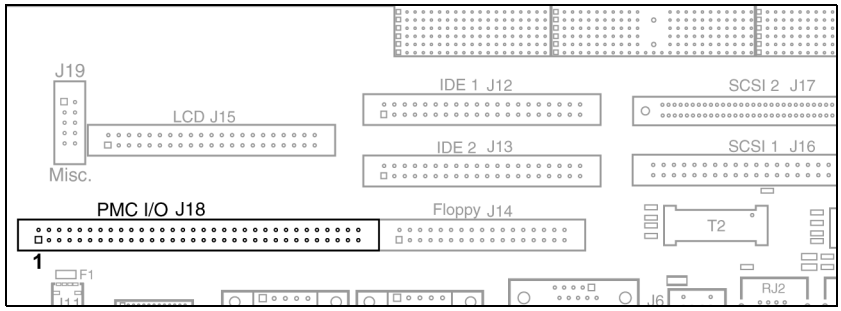
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	LC_P23	12	LC_P11	23	LC_P09	34	LC_BACKL
2	LC_P22	13	LC_P12	24	LC_P10	35	LC_VEE
3	LC_P21	14	LC_P13	25	GND	36	LC_VCC
4	LC_P20	15	LC_P14	26	LC_P00	37	KBDATA
5	LC_P19	16	LC_P15	27	LC_P01	38	KBCLK
6	LC_P18	17	LC_P17	28	LC_P02	39	C2_RXD
7	GND	18	GND	29	LC_P03	40	C2_TXD
8	LC_CLK	19	LC_P05	30	LC_P04	41	MDATA
9	LC_HSYNC	20	LC_P06	31	LC_P16	42	MCLK
10	LC_VSYNC	21	LC_P07	32	GND		
11	GND	22	LC+P08	33	LC_DE		

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PMC

The following table lists the pin assignments of the PMC connector.



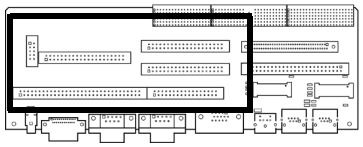


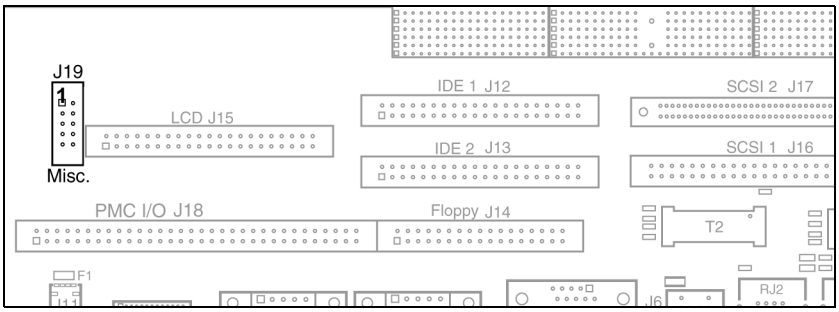
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	PMCIO01	17	PMCIO17	33	PMCIO33	49	PMCIO49
2	PMCIO02	18	PMCIO18	34	PMCIO34	50	PMCIO50
3	PMCIO03	19	PMCIO19	35	PMCIO35	51	PMCIO51
4	PMCIO04	20	PMCIO20	36	PMCIO36	52	PMCIO52
5	PMCIO05	21	PMCIO21	37	PMCIO37	53	PMCIO53
6	PMCIO06	22	PMCIO22	38	PMCIO38	54	PMCIO54
7	PMCIO07	23	PMCIO23	39	PMCIO39	55	PMCIO55
8	PMCIO08	24	PMCIO24	40	PMCIO40	56	PMCIO56
9	PMCIO09	25	PMCIO25	41	PMCIO41	57	PMCIO57
10	PMCIO10	26	PMCIO26	42	PMCIO42	58	PMCIO58
11	PMCIO11	27	PMCIO27	43	PMCIO43	59	PMCIO59
12	PMCIO12	28	PMCIO28	44	PMCIO44	60	PMCIO60
13	PMCIO13	29	PMCIO29	45	PMCIO45	61	PMCIO61
14	PMCIO14	30	PMCIO30	46	PMCIO46	62	PMCIO62
15	PMCIO15	31	PMCIO31	47	PMCIO47	63	PMCIO63
16	PMCIO16	32	PMCIO32	48	PMCIO48	64	PMCIO64

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Miscellaneous Connector J18

The miscellaneous connector is a 2-row, 10-pin male connector providing signal lines for a reset button, an external speaker, an external battery and ICMB/SMB communication. A dedicated cable assembly is required.

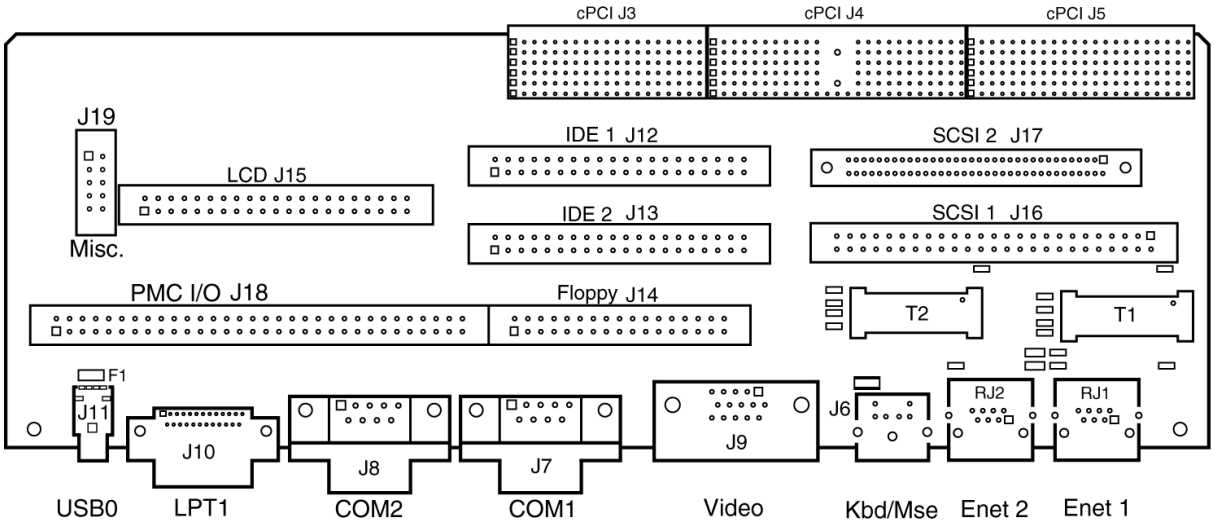




Pin	Signal	Pin	Signal
1	SPKR	6	GND
2	WDG_REL	7	ICMB_A
3	RST_BUT	8	SMB_SDA
4	VBATIN	9	ICMB_B
5	GND	10	SMB_SCL

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Placement Plan



Specifications

General	Model CE7-TM / CT7-TM Peripheral Transition Board Host Compatibility C E7 and CT7 cPCI SBC
Electrical Power	Drive Requirement Only
Physical	Size 6U x 80mm
Environment Conditions	0 to 55° Celsius Inlet Air Operating -40 to 85° Celsius Non-Operating Cooling: None

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Appendix D: PCI Mezzanine Card (PMC)

The PCI Mezzanine Card (PMC) Interface is an additional slot for parallel mounted expander or option cards. The 64-bit/33MHz Interface is compliant to the IEEE P1386.1 specification and is based on the electrical and logical layer of the PCI specification. The user definable I/O Pins are connected to the rear IO connector on the CT7, as defined in the PICMG 2.3 specification.

— A 64Bit PCI-communication is only possible between CPCI- and PMC- devices
— A 5V key is mounted, for 5V compatible PMC-Cards. A PMC-Interface with 3.3V I/O has to be 5V compliant.

Also see chapter “PMC Connectors P7001, P7002, and P7003” on page 32 for details on the CT7 interface pin assignment.

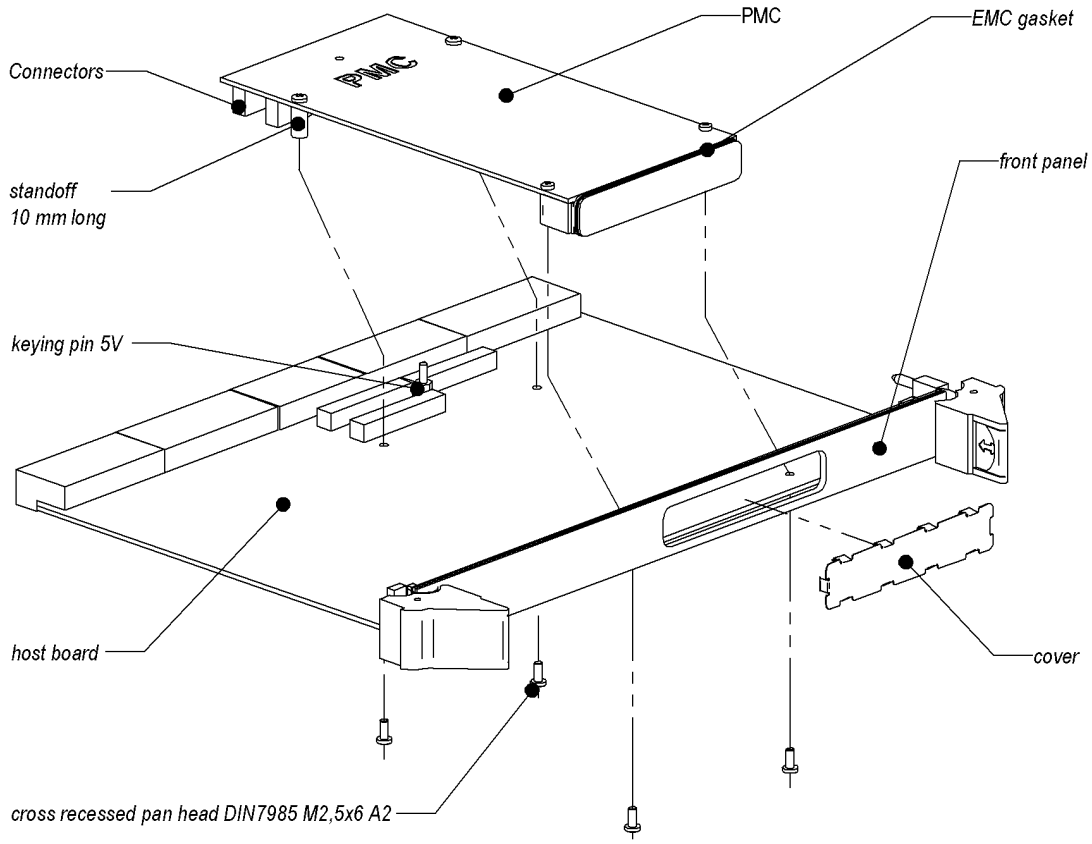
Electrical characteristics

Parameter	Comment	Value	Unit
I3.3V	Max. current on 3.3V Pins	1.5	A
I5V	Max. current on 5V Pins	1	A
I+12V	Max. current on +12V Pin	0.5	A
I-12V [a]	Max. current on -12V Pin	0.1	A
V(I/O) [b]	Voltage for PCI IO	5	V

a. -12V must be connected to the backplane.
b. 5V key is mounted.

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Assembly PMC to ET7 Please refer to the drawing for assembly and mounting instructions:



To mount a PMC board to the CT7 follow these steps:

1. Remove cover.
2. Take PMC from inside through front panel and push connectors together.
3. Verify correct installation of EMC gasket!
4. Fix PMC on host boards with 4 screws. Screws must be locked with Loctite 243.

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Appendix E: Support, Service, and Warranty Information

Chapter Scope

The following sections describe SBS Technologies' product support program. It states our product warranty terms and provides details about what action to take if you experience a problem with the product.

Technical Support

If you should have a problem with a SBS product: Free technical support is available by phone, fax or email. Telephone support is available during the hours indicated.

Europe	**USA & World**
Monday through Friday 8:00 – 17:00 (Germany)	Monday through Friday 8:30 AM – 5:30 PM (Eastern Time)
Phone +49 (821) 5034-170 Fax +49 (821) 5034-119 E-Mail Aug-support@sbs.com	Phone (505) 875-0600 Fax (505) 875-0400 E-Mail support.government@sbs.com

Support on the Web

For support and information, visit our website at

http://www.sbs.com

A library of drivers, manuals, error report forms, updates, and applications notes is also available on our FTP-servers:

ftp://www.sbs.com

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Information for components, corresponding driver software, etc. can also be found at the following locations:

AMD Advanced Microsystems Devices Corp.	www.amd.com
American Megatrends (BIOS)	www.ami.com
Asiliant Technology (Chips & Technology VGA)	www.asiliant.com
IBM Corp.	www.ibm.com
Intel Corp.	www.intel.com
Linear Technology	www.linear-tech.com
Microsoft Corp.	www.microsoft.com
Motorola Corp.	www.motorola.com
PCI Industrial Computer Manufacturing Group	www.picmg.org
QLogic Corp.	www.qlogic.com
QNX Software Systems	www.qnx.com
Smybios Logic	www.lsilogic.com
Tundra Semiconductor Corp.	www.tundra.com
VMEbus International Trade Association	www.vita.org
Wind River Systems	www.windriver.com

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Frequently Asked Questions

This section covers frequently asked questions. It describes solutions and workarounds in order to help customers to understand the solution and speed up customer system design implementations.

Q 1. *We have a CT7 with a CTM10 transition module running Windows NT 4.0 workstation with Service Pack 6 installed. The Ethernet is connected to port 1. This port is seen as port 2 in software. How can I configure the port identification?*

A 1. We have confirmed this behavior. The ports are "switched" by the operating system. At present, there is no method to prevent Windows NT from toggling the port assignment.

Q 2. *If the CT7 has an ET7 module mated to it, does the ET7 have to be plugged into the backplane.*

A 2. The CT7 is available in two options in regard to the ET7:

- CT7xxxxxxx1x Dual slot, ET7 with 2 PMC
  Backplane with system slot on the left side for CT7, ET7 is plugged into slot 2.
- CT7xxxxxxx2x Dual slot, ET7 with 2 PMC and cPCI extension
  Backplane with system slot on the right side for CT7, ET7 is in the second backplane with system slot on the left side

The CT7/ET7 combination does not work if the ET7 module is not plugged into the backplane. If you split the CT7/ET7 combination, the CT7 can be used as a single board.

Q 3. *I am working with the RMX Operating System. The board works fine except for the activation of serial ports.*

A 3. RMX is an old PC operating system and requires the definition of I/O addresses. Simply assign I/O addresses for serial port 1 and 2 in the systems BIOS setup on page "Peripheral Setup": Change the setting "Auto" for the "On Board Serial Port #" to an appropriate value, e.g. 2F8h for COM2.

Q 4. *How much flash memory can I install on the CT7?*

A 4. The maximum size available for a Flashcard currently is 512 MB, however, the CT7 supports up to 1 GB. The capacity limitations are the same as for high capacity hard disk drives. There is a height limitation of 10 mm.

Q 5. *During boot, a temperature is displayed along with other boot messages. What temperature value is this?*

A 5. This is the temperature value measured by a thermal diode on the CPU die.

Q 6. *What PCI/PMC standards are officially supported by SBS for the CT7?*

A 6. The CT7 is in compliance with:

- cPCI-PICMG 2.0 Rev. 2.3
- PCI 2.2 Rev. 2.3

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Q 7. *What kind of PMC cards can be attached to the CT7?*

A 7. The CT7 supports both 5V and 3.3V PMC cards.

Q 8. *What network boot options are available on the CT7?*

A 8. Network boot is available through BootP DHCP. The function is only supported on channel one.

Q 9. *How can I detect the slot where the CT7 is mounted via software?*

A 9. The slot number is displayed during system boot.

Q 10. *What LCD panels have been tested with the CT7?*

A 10. The following panel have been successfully tested with the CT7:

- NEC NL6448AC33-18 (640 x 480 TFT 18 Bit)
- Sharp LQ10S21 (800 x 600 TFT 18 Bit)

Q 11. *What do the LEDs on the front panel mean?*

A 11. There are three LEDs on the boards front panel:

- Blue - HotSwap
- Green - Run
- Red - Fail

During power up, the BIOS turns the LEDs off to indicate that the CT7 has started. Before entering the OS boot sequence, the green LED (Run) is turned on. While the operating software is active, it is free to use both LEDs for its own purposes. In reset state, the red LED is on, the green LED is off.

The blue LED is lighting when the ejector is open.

Q 12. *That is the difference between the two floppy disk cables (34 pin standard cable vs. 26 pin slim line cable) and what has to be considered when used with the CT7?*

A 12. The standard cable can be used for two floppy disk drives (A: and B:). The standard cable changes the two lines 10 and 16 on the secondary floppy connector (B:). When using a standard cable connected to floppy A:, the BIOS setup has to be changed. Set the “SWAP FLOPPY DRIVES” parameter in the “Peripheral Setup” to “Yes”. A slim line cable can only be used for one floppy drive (A: or B:). The “SWAP FLOPPY DRIVES” parameter in the “Peripheral Setup” must be set to “No” for either drive when using a slim line cable.

Q 13. *Do I need to supply +5V to the floppy?*

A 13. The +5V must be supplied to the floppy only when using a 2.54 mm 34-pin connector.

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Warranty

SBS Technologies' products come with a "return-to-factory" warranty which covers defects in materials and workmanship for a period of two years from the date of product shipment to the customer (original purchaser), provided the product is unmodified and has been subject to normal and proper use. This warranty applies to all standard board-level products which do not incorporate disk drives. Products which incorporate floppy or hard disk drives are also warranted for one year with the exception of the drives themselves. The drives will be warranted for a period of six months, as is the normal period for electromechanical components. SBS Technologies makes no warranty or representation, express or implied, with respect to software, its performance, quality, or fitness for a particular purpose. This does not include the media on which the software is distributed, which carries a warranty covering defects in materials and workmanship for a period of six months. For details refer to the "Terms and Conditions."

Warranty and Non-Warranty Repairs

Warranty Repairs

Any product returned and found to be under warranty will be repaired or replaced at the discretion of SBS. The return shipping freight is paid by SBS.

Non-Warranty Repairs

If a product is found not to be under warranty, SBS will:

1. repair the product without notice of the customer when the cost is below Euro/US$250.
2. notify the customer of the non-warranty situation and provide a cost estimate to the customer, if the cost of the repair is equal to or greater than Euro/US$250. Non-warranty repairs above Euro/US$250 generally require that a purchase order be issued to SBS Technologies for the amount of the repair before repairs are undertaken.

The shipping freight is paid by the customer in addition to repair cost.

Procedure

In the event of repair, please return the product together with additional information:

— Description of the type of defect.
— Is the defect restricted to certain environmental conditions?
— What was the hardware environment before the defect appeared?
— Where there input signals? If yes, which?
— Please specify: "warranty" or "no warranty" repair.

You may use the report form at the end of this manual for this purpose.

Please use the original packing material for shipping to avoid damage. Otherwise warranty may be lost.

To expedite assistance for problems, also provide the following:

— Your Name, Phone and Company.
— Product with which you are having trouble.
— Serial Number, Part Number and Revision.
— Hardware environment the product is used.
— Operating system you are running.
— Detailed description of your problem and any error messages that have appeared on the screen.
— The name of a technically qualified individual at your company familiar with the product failure.

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Depending on the circumstances of the problem, it may be deemed necessary to return the product to SBS Technologies for repair. In order to return the product for repair, the following steps are necessary:

1. Obtain a Return Material Authorization number (RMA#) from SBS Customer Support.
2. Ship the product prepaid to the designated repair point.
3. Provide a written description of the claimed defect with the product.

Obtaining a RMA Number

To obtain a product *Return Merchandise Authorization* number (RMA#), you should call our Customer Service department through our main number.

Shipping the Product

Any product returned to SBS should be in its original shipping carton if possible. Otherwise the product should be carefully packed in a conductive (ESD) packing material and placed in a cushioned corrugated carton suitable for shipping.

Please mark the shipping label with the RMA number and return it to:

Europe

SBS Technologies GmbH & Co. KG
GmbH & Co. KG
RMA# (put RMA here)
Memminger Strasse 14
86159 Augsburg
Germany

USA & World

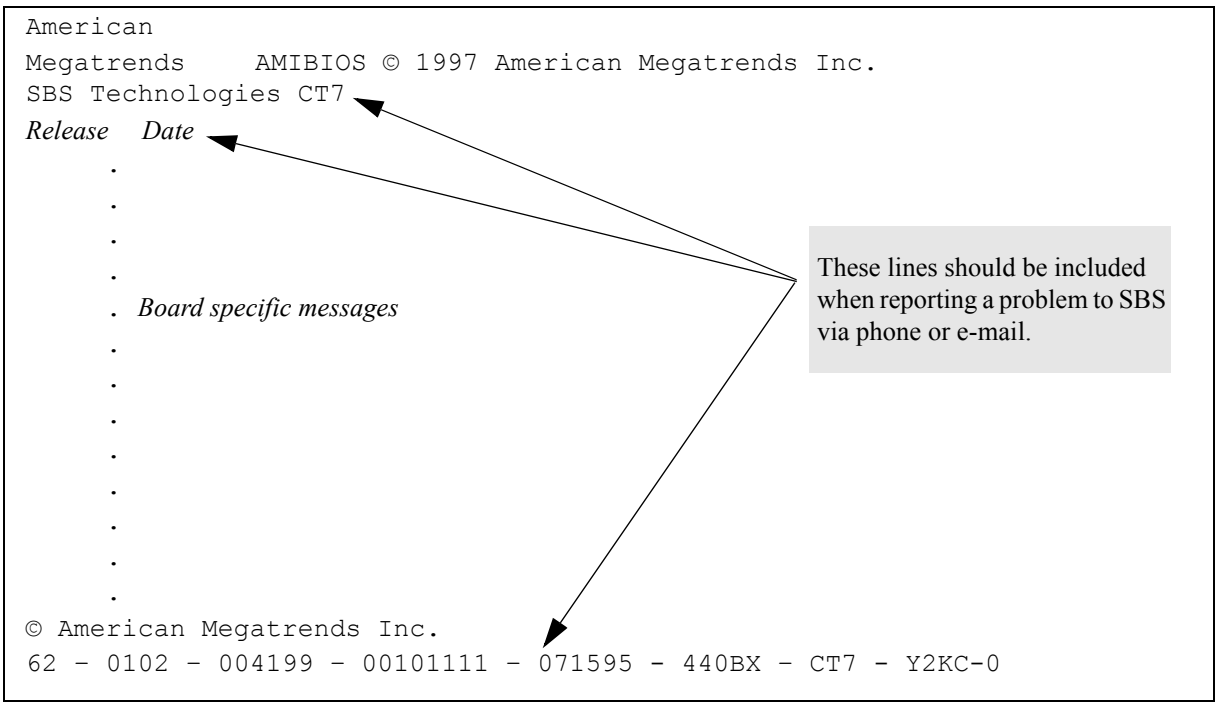
Customer Service Dept.
ATTN: *RMA# (put RMA here)*
SBS Technologies, Inc.
2400 Louisiana Blvd. NE, Suite 5-600
Albuquerque, NM 87110
U.S.A.

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Error Report Form

When you are returning a product for repair, it is very important to include a written report which details the nature of the problem in order to expedite the repair. Please always use the *Error Report Form* attached at the end of this manual or include the following information:

- RMA Number, if applicable
- Product & Serial Number
- Part Number
- Version
- Contact: Name & Phone Number
- Detailed Description of the Problem/Defect



Example/coding of the ID line:

processor, flash ROM size	major & minor BIOS revisions	supplier ID	BIOS features	AMIBIOS core copyright date	chip set	project ID	year 2000 compliant
62 -	0102 -	004199 -	00101111 -	071595 -	440GX -	CT7/CE7 -	Y2KC-0

You can stop the video output for proper reading the three information lines as described: Simply press the “0 / Enter” key during the start-up sequence. This key is located on the numeric keypad of your keyboard.

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ERROR REPORT FORM EUROPE

Please send report to

SBS Technologies GmbH & Co. KG
Memminger Strasse 14
D–86159 Augsburg
Phone +49.821.5034-170
Fax +49.821.5034-119
E-Mail Aug-Support@sbs.com

Sender's address

COMPANY NAME

DEPARTMENT & CONTACT PERSON

MAILING ADDRESS

ADDRESS (CONT'D)

ZIP CODE AND CITY, COUNTRY

PHONE

FAX

Product

PART NUMBER, E.G. CT7

VERSIONS AND DATE

SERIAL NUMBER

Error Description

PLEASE DESCRIBE THE ERROR OR PROBLEM YOU ARE EXPERIENCING

Hardware

PLEASE DESCRIBE THE HARDWARE ENVIRONMENT YOU ARE USING

OS / Software

PLEASE PROVIDE INFORMATION ON YOUR OPERATING SYSTEM AND VERSION, APPLICATION SOFTWARE, ETC.

Warranty repair? PLEASE INDICATE, IF THIS IS A WARRANTY REPAIR. SEE SECTION "WARRANTY" FOR DETAILS. YES ☐ NO ☐

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ERROR REPORT FORM UNITED STATES AND THE REST OF THE WORLD

Please send report to

SBS Technologies, Inc.
6301 Chapel Hill Road
Raleigh, NC 27607, U.S.A.
Phone +1.919.851.1101
Fax +1.919.851.2844
E-Mail support.sbc@sbs.com

Sender's address

COMPANY NAME

DEPARTMENT & CONTACT PERSON

MAILING ADDRESS

ADDRESS (CONT'D)

CITY, STATE, ZIP CODE

PHONE

FAX

RMA

PUT YOUR RMA NUMBER HERE

Product

PART NUMBER, E.G. CT7

VERSIONS AND DATE

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