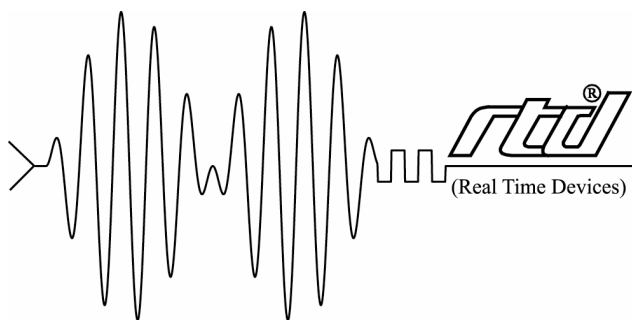


CM6109

PCMCIA utilityModule™

User's Manual



RTD Embedded Technologies, Inc.
"Accessing the Analog World"®

BDM-610020003
Rev. B

ISO9001 and AS9100 Certified

CM6109

PCMCIA utilityModule™

User's Manual



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Revision History

Rev. A	New manual naming method
Rev. B	02/26/2009 added note that CardBus cards are not supported

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Chapter 1 INTRODUCTION

This manual gives information needed to use the CM6109 PCMCIA utilityModule, which offers one or two PCMCIA slots on a single PC/104 format card. The term *PCMCIA card* and *PC card* are used interchangeably throughout the manual.

CM6109 PCMCIA utilityModule

The CM6109 PCMCIA utilityModule was designed to provide PCMCIA support for RTD Embedded Technologies, Inc. cpuModules or other standard PC/104 modules.

Hardware Features

- One or two PCMCIA slots with ejectors
- Supports Type I, II, and III PCMCIA cards (**!!Does not support CardBus cards!!**)
- Accepts two Type I, Type II, or Type III cards in the top and Type I or Type II in the bottom at the same time
- Supports SRAM, Flash, and ATA Flash memory cards
- Supports ATA hard disk drives, SRAM, Flash, modems, and LAN and I/O cards
- Supports both 5 VDC and 3.3 VDC cards
- Permits insertion and removal of cards with system power on
- LED indication and current limiting protection of short-circuited PC card
- 16-bit bus interface
- All CMOS design gives low power consumption
- Compatible with the standards of PCMCIA (Personal Computer Memory Card International Association) Release 2.0 Standard

Connectors

The connectors provided are:

- One or Two PCMCIA slots with ejectors
- PC/104 Bus (AT)

Jumpers

- One Jumper (JP1) used to select secondary adapter when using two cards in one system.

Physical Characteristics

- Dimensions 3.8" x 5.1" x 0.6" Note: With standard PC Card Installed
- 4-layer PCB
- Operating conditions:
 - temperature: -40 to +85 degrees C
 - relative humidity: 5 - 95%
- Storage temperature: -55 to +85 degrees C

Component Locations

Figure 1 shows the locations of major components of the utilityModule.

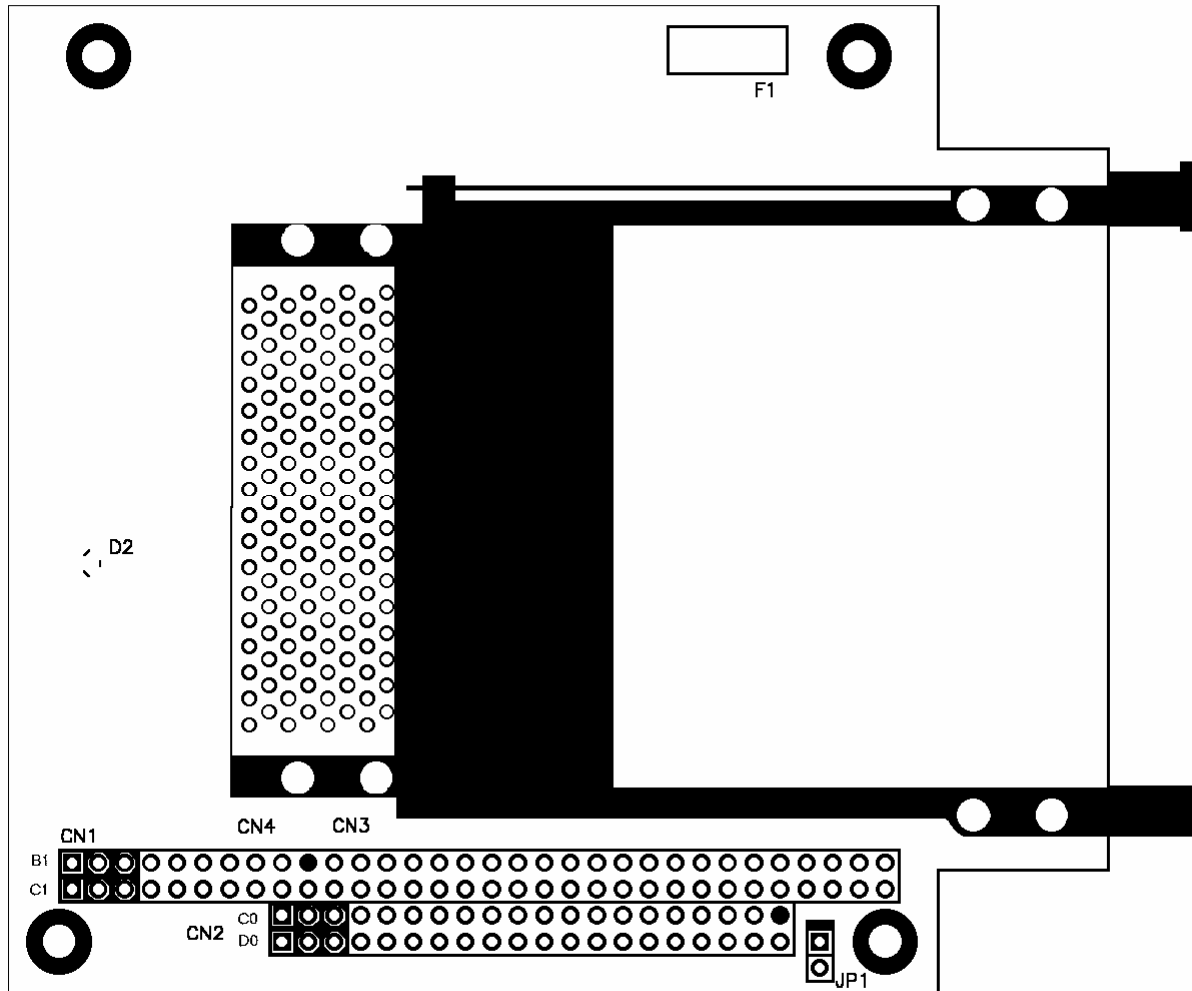


Figure 1 Component Locations

Table 1.1 Component Locations		
Connector	Function	Size
CN1	PC/104 XT bus	64 pin
CN2	PC/104 AT bus	32 pin
CN3	PCMCIA Slot 1	68 pin
CN4	PCMCIA Slot 2	68 pin
JP1	SLOT 0/1 or 2/3 SELECT	2 pin
D2	Over-Current Indicator	LED

Chapter 2 CONNECTORS

The following sections describe the connectors of the utilityModule.

PC/104 AT Bus Connectors, CN1 and CN2

Connectors CN1 and CN2 provide the PC/104 AT bus connections. CN1 carries the XT bus signals, while CN2 carries the additional signals needed for the AT bus. The functions and definitions of the signals on these connectors conform to the IEEE P966 standard for the PC/104 bus.

The following table lists the pinouts of connector CN1:

Table 1-11 PC/104 Bus Connector CN1		
Pin	Row A	Row B
1	IOCHCHK*	0V
2	SD7	RESETDRV
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	ENDXFR*
9	SD0	+12V
10	IOCHRDY	(KEY)
11	AEN	SMEMW*
12	SA19	SMEMR*
13	SA18	IOW*
14	SA17	IOR*
15	SA16	DACK3
16	SA15	DRQ3
17	SA14	DACK1*
18	SA13	DRQ1
19	SA12	REFRESH
20	SA11	SYSCLK
21	SA10	IRQ7
22	SA9	IRQ6
23	SA8	IRQ5
24	SA7	IRQ4
25	SA6	IRQ3
26	SA5	DACK2*
27	SA4	TC
28	SA3	BALE
29	SA2	+5V
30	SA1	OSC
31	SA0	0V
32	0V	0V

The following table lists the pinouts of connector CN2:

Table 1-12 PC/104 Bus Connector CN2		
Pin	Row C	Row D
1	0V	0V
2	SBHE*	MEMCS16*
3	LA23	IOCS16*
4	LA22	IRQ10
5	LA21	IRQ11
6	LA20	IRQ12
7	LA19	IRQ15
8	LA18	IRQ14
9	LA17	DACK0*
10	MEMR*	DRQ0
11	MEMW*	DACK5*
12	SD8	DRQ5
13	SD9	DACK6*
14	SD10	DRQ6
15	SD11	DACK7*
16	SD12	DRQ7
17	SD13	+5V
18	SD14	MASTER*
19	SD15	0V
20	KEY(nc)	0V

PCMCIA Slots, CN3 and CN4

CN3 and CN4 are the two PCMCIA slots, which accept standard Type I, II, and III PCMCIA cards with 68-pin connectors. The top slot (farthest from the circuit board) is considered the first slot, while the bottom slot (closest to the circuit board) is considered the second slot. See the *Using the utilityModule* section for information on the assignment of drive letters to the slots.

Chapter 3 **INSTALLING THE UTILITYMODULE**

Since the utilityModule uses a PC/104 stackthrough bus, the only hardware installation you will do is placing the CM6109 on the PC/104 stack. To do this, you will simply plug the PC/104 bus connector composed of CN1 and CN2 onto the matching connector of your cpuModule.

We recommend you follow the procedure below to ensure that stacking of the modules does not damage connectors or electronics.

- Turn off power to the PC/104 system or stack.
- Select and install standoffs to properly position the utilityModule on the PC/104 stack.
- Touch a metal part of the rack to discharge any buildup of static electricity.
- Remove the utilityModule from its anti-static bag.
- Check that any keying pins in the bus connector are properly positioned.
- Check the stacking order; make sure an XT bus card will not be placed between two AT bus cards or it will interrupt the AT bus signals.
- Hold the utilityModule by its edges and orient it so the bus connector pins line up with the matching connector on the stack.
- Gently and evenly press the utilityModule onto the PC/104 stack.

CAUTION: Do not force the module onto the stack! Wiggling the module or applying too much pressure may damage it. If the module does not readily press into place, remove it, check for bent pins or out-of-place keying pins, and try again.

JP1 Settings

JP1 is used to configure the CM6109 as the first adapter or as the secondary adapter when using two CM6109s in the same system. The Default setting is no jumper installed which sets the CM6109 chip select to Sockets 0 and 1. Installing JP1 enables a chip select to set the second CM6109 to Sockets 2 and 3.

Circuit Protection

PC Cards are inherently subject to damage that results from mishandling the card. Circuitry has been added to protect the circuitry and warn the user of a short circuit condition. D2 is an LED indicator of a short-circuit condition of one of the sockets. Immediately remove the PC Card or power down the system if D2 is on.

Chapter 4 INSTALLING THE UTILITYMODULE SOFTWARE

The CM6109 is supplied PCMCIA-compliant software drivers. See the users manual in .PDF file format included on Disk #1 for DOS installation and usage and Windows NT 4.0 drivers manual include also on the DOS Disk #1 of the installation disks. Windows 95 / 98 has PCMCIA support built into its operating system.

The following sections are basic applications of system integration for use with other drivers. For other operating systems please contact your software supplier for drivers for the specific operating system.

PCMCIA Controller Register address

The CL-PD6722 internal registers are accessed through a pair of Operation registers---an Index register and a Data register. The Index register is accessed at address 03E0h, and the Data register is accessed at 03E1h.

For more information about specific register mapping see the www.basiscomm.com website to download the databook in .PDF file format.

Setting I/O and Memory Windows

Some PCMCIA devices such as LAN cards and I/O cards require an I/O window and/or a memory window. The default I/O window for the CM6109 is located at I/O addresses 300h to 31Fh. The default memory window is located at addresses D0000h to D7FFFh.

Note that these default I/O and memory addresses are frequently the defaults for other PC/104 modules and Solid State Disks. You may therefore need to change the location and size of the I/O window and memory window to prevent conflicts and ensure proper operation.

You can change the I/O and memory windows by appending the following text to the command line in the CONFIG.SYS file that loads the device driver:

/IOW=uuu-vvv /MEMW=xxxx-yyy

Where:

uuu is the I/O window starting address (3 hex digits), and ***vvv*** is the I/O window ending address (3 hex digits).

xxxx is the memory window starting address (first 4 hex digits), and ***yyy*** is the memory window ending address (first 4 hex digits).

Note that if the ***/IOW=*** text is added without the ***uuu-vvv*** argument, the I/O window is disabled entirely. Also, if the ***/MEMW=*** text is added without the ***xxxx-yyy*** argument, the memory window is disabled.

Example

To open an I/O window from 300h to 33Fh and a memory window from E0000h to E3FFFh, you would modify the line in your CONFIG.SYS file which loads the device driver to read:

```
DEVICE=C:\SOMEFOLDER\SOMEDRIVER.SYS /A /IOW=300-33F /MEMW=E000-  
E3FF
```

I/O Address Map

NOTE: To ensure correct operation, you must make *absolutely certain* that I/O and memory addresses used by the CM6109 are *not* used by other devices in the system (dataModules, cpuModule, Solid State Disk, etc.).

The CM6109 always uses I/O addresses 0240h through 024Fh. For proper operation, you must make absolutely certain no other board in your PC/104 system uses those I/O addresses.

If you are using a PCMCIA I/O card which requires an I/O address window, you must also ensure that the addresses in that window are not used by other boards in your PC/104 system.

If you are using a PCMCIA ATA drive, I/O address 0170h is also used. You must ensure that that address is not used by any other board in your PC/104 system.

Note that the CM6109 only decodes address lines A0 through A9 on I/O accesses.

Assigning Interrupt Channels to COM Ports

When you use a PCMCIA card (such as a modem) that requires a COM port, the CM6109 driver software must assign a COM port to the PCMCIA card. When such a card is detected, the software will assign the next COM port not already in use by the system. When the software assigns the port it also assigns an associated interrupt (IRQ) channel. The default interrupt channel for each COM port is shown below:

Default Interrupts for COM Ports	
COM Port	Default Interrupt
COM1	IRQ4
COM2	IRQ3
COM3	IRQ4
COM4	IRQ3

You may override the default and select the interrupt channel assigned to a particular COM port by appending the following text string to the line in your CONFIG.SYS file which loads the device driver:

```
/COMnIRQ=c
```

Where the letter 'n' is replaced with the COM port number and the letter 'c' is replaced with the interrupt channel to be assigned. The COM port number can be 1, 2, 3, or 4, and the interrupt number can be: 3, 4, 5, 6, 7, 10, 11 or 14.

NOTE: The interrupt used for the slot-event interrupt (by default IRQ11) cannot be assigned to a COM port. Refer to the next section for information on the slot-event interrupt.

Example

If you wish to assign interrupt channel 5 (IRQ5) to COM port 3, you would modify the line in your CONFIG.SYS file which loads the device driver to read:

```
DEVICE=\SOMEFOLDER\SOMEDRIVER.SYS /A /COM3IRQ=5
```

Assigning Interrupts for the PCMCIA Slots

The PCMCIA controller on the CM6109 requires one interrupt line to signal slot events such as card insertion. The default interrupt used by the CM6109 is IRQ11. The slot-event interrupt can be changed by modifying your CONFIG.SYS file.

To change the interrupt, append the following text string to the command line which loads the driver:

```
/SCIRQ=c
```

Where the letter 'c' is replaced with the desired interrupt number: 3,4,5,6,7,10,11, or 14

Example

If you wished to use interrupt IRQ5 as the slot-event interrupt, you would change your CONFIG.SYS file so the line used to load the driver reads:

```
DEVICE=\ SOMEFOLDER\SOMEDRIVER.SYS /SCIRQ=5
```

Chapter 5 **USING THE UTILITYMODULE**

The following sections describe the use of the CM6109 utilityModule.

How Software Assigns Drive Letters

When the CM6109 drivers are loaded, the software assigns drive letters to the PCMCIA slots. On the standard CM6109 utilityModule with two slots, the upper slot is assigned the second drive letter not in use by Solid State Disks, floppy drives, or hard disks already in the system. The lower socket is assigned the first unused drive letter. On boards ordered with the option of a single slot, that slot is assigned the first unused drive letter.

Card Recognition Beep Codes

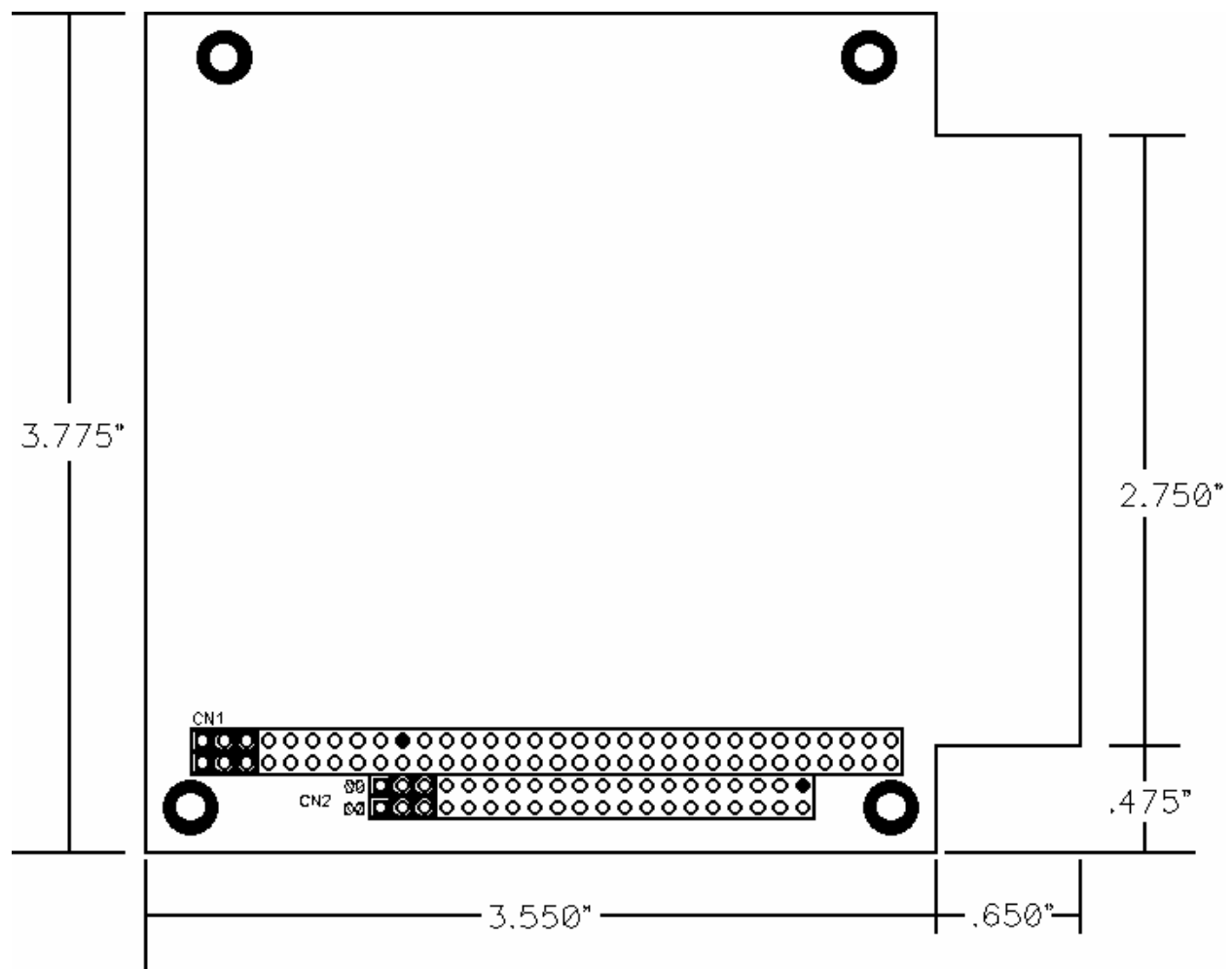
If a speaker is present in your PC/104 system, the CM6109 utilityModule will cause it to beep when PCMCIA cards are inserted. The number of beeps indicate whether the card has a valid CIS (Card Identification String), which identifies it as a valid PCMCIA card type, and whether it is formatted properly.

Chapter 6 **HARDWARE REFERENCE**

Mechanical Dimensions

The following illustration shows the dimensions of the utilityModule in inches (+/- 0.005").

NOTE: An installed PCMCIA card extends 0.9" from the right side of the edge of the board.



Chapter 7 RETURN POLICY AND WARRANTY

Return Policy

If you wish to return a product to the factory for service, please follow this procedure:

Read the Limited Warranty to familiarize yourself with our warranty policy.

Contact the factory for a Return Merchandise Authorization (RMA) number.

Please have the following available:

- Complete board name
- Board serial number
- A detailed description of the board's behavior

List the name of a contact person, familiar with technical details of the problem or situation, **along with their phone and fax numbers, address, and e-mail address** (if available).

List your shipping address!!

Indicate the shipping method you would like used to return the product to you.

We will not ship by next-day service without your pre-approval.

Carefully package the product, using proper anti-static packaging.

Write the RMA number in large (1") letters on the outside of the package.

Return the package to:

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USA

Chapter 8 LIMITED WARRANTY

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