The Engine of the PC-105T (PCM-5821)

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3.1 Introduction

The PCM-5821 is a highly reliable single board computer based on the NS GX1 300MHz CPU. It offers built-in functionality comparable to a complete industrial PC system, including a VGA/LCD controller, network communications, compact flash diak in a small 8" x 5.75" form factor.

For maximum performance, the PCM-5821 also supports an SDRAM SODIMM socket that can accept up to 128 MB memory. On-board features include an Ethernet interface, audio interface, socket for Compact Flash Card, Enhanced IDE interface with up to Ultra DMA transfer protocol, one parallel port, four serial ports (RS-232 and RS-232/422/485) with DB-9 connector, and a mini-DIN PS/2 keyboard/mouse interface. An SVGA/LCD display controller (LCD, and CRT displays) allows LCD screen resolutions up to 800 x 600 @ 256 K colors.

The PCM-5821 complies with the "Green Function" standard and supports three types of power saving features: Normal, Doze, and Sleep modes.

The display type configuration is done through software. A single Flash chip holds the system BIOS and the VGA BIOS. This minimizes the number of chips and eases configuration. You can change the display BIOS simply by programming the Flash chip.

It also offers faster data access and longer MTBF than mechanical disk drives and is an ideal solution for critical commercial or industrial applications. The watchdog timer ensures the system will be reset if it stops due to a program bug or EMI problem.

3.2 Features

- Ultra-compact size single board computer as small as a 3 1/2" hard disk drive (145 mm x 102 mm)

- On-board NS GX1 300 MHz CPU

- Up to 128 MB system memory by SODIMM (SDRAM)

- On-board VGA/LCD controller

- On-board 10/100Base-T Ethernet interface

- Supports on-board CompactFlash™ socket

- Built-in Enhanced IDE (AT bus) hard disk drive interface

- Four serial ports: three RS-232, one RS-232/422/485 or infared selectable (uses 16C550 UARTs with 16 byte FIFO)

- Green engine with sleep mode and low power consumption

- Single +5 V power supply

3.3 Jumpers and Connectors

3.3.1 Setting jumpers

You can configure your panel PC to match the needs of your application by setting jumpers. A jumper is the simplest kind of electrical switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either pins 1 and 2 or pins 2 and 3.

Open   Closed   Closed 2 - 3
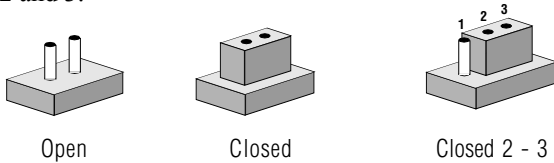
The jumper settings are schematically depicted in this manual as follows:

Open   Closed   Closed 2 - 3
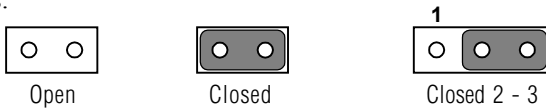
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

3.3.2 Jumpers

The motherboard of the panel PC has a number of jumpers that allow you to configure your system to suit your applications. The table below lists the function of each of the board jumpers.

Table 3-1: Jumpers and their functions

Label	Function
JP1	Power type of Lan
JP2	CMOS Clear and Watchdog Timer action
JP3	COM2 RS-232/422/485 Setting
JP4	COM2 RS-232/422/485 Setting
JP5	COM2 RS-232/422/485 Setting
JP10	Buzzer enable

3.3.3 Connectors

Onboard connectors link the panel PC to external devices such as hard disk drives or floppy drives. The table below lists the function of each of the board's connectors.

Table 3-2: Panel PC connectors

Label	Function
J1	Inverter power connector
J2	Flat panel display connector
J3	Primary IDE hard drive connector
J4	Keyboard connector
J5	Internal touchscreen connector
CN1	SODIMM socket
CN2	Compact Flash Disk secondary IDE connector
CN3	CD IN
CN4	I/O board connector
CN5	I/O board connector
CN6	Power FAN power connector
CN7	External KBT2
CN8	CPU FAN power connector
CN10	Power Switch
CN20	Speaker and Microphone connector (Reserved)
PS1	Power test connector (Reserved)
JS2	Brightness VR (Reserved)

Power Fan
power connector
(CN6)

Power test
connector (PS1)

Brightness
VR(JS2)

NS GX1
processor

I/O board
connector (CN4)

CPU Fan
power
connector
(CN8)

Buzzer enable
(JP10)

CD IN connector
(CN3)

I/O board
connector (CN5)

Chipset
Cx5530

Power type of
Lan (JP1)

Primary IDE
Connector (J3)
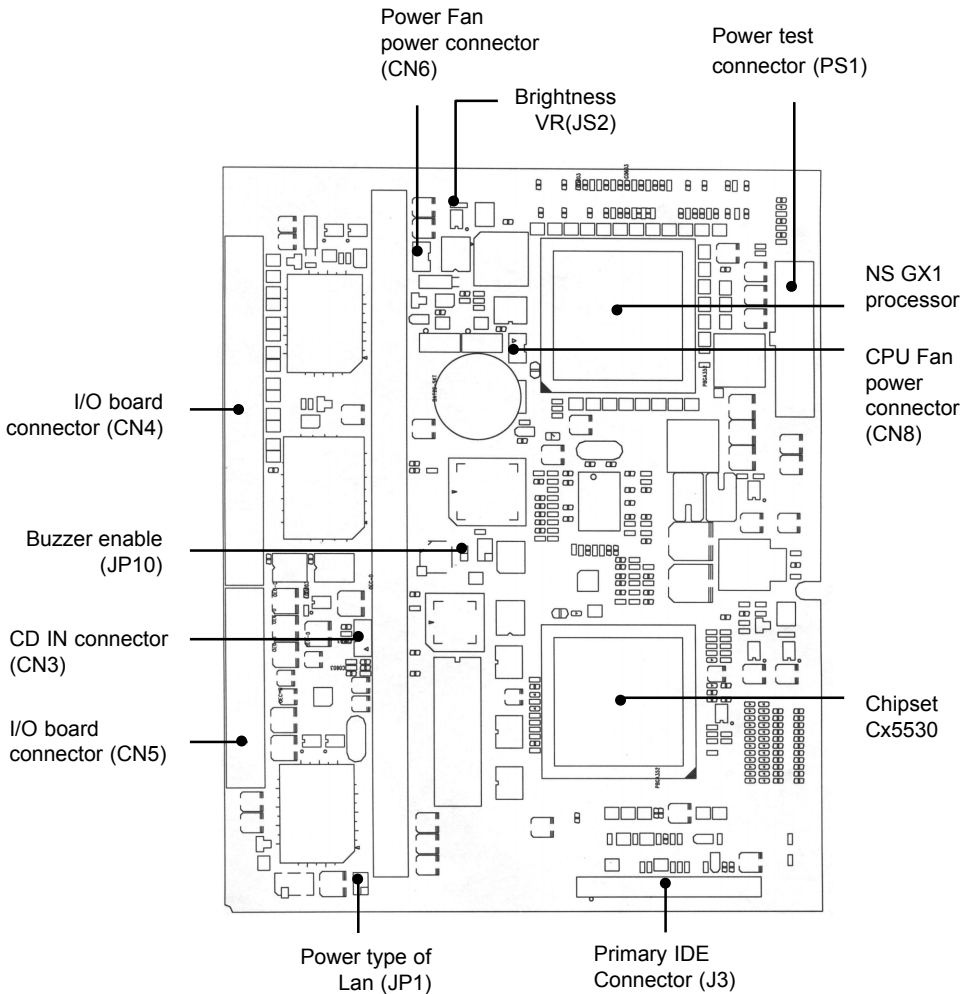
Figure 3-1: Locating jumpers and connectors on PCM-5821 (front side)

SODIMM socket (CN1)

Inverter Power Connector(J1)

COM2 RS-232/ 422/485 Setting (JP3,JP4,JP5)

Power Switch (CN10)

CMOS clear and Watchdog Timer (JP2)

Flat Panel Display Connector (J2)

Speaker and Microphone connector (CN 20)

Compact Flash Disk secondary IDE connector (CN2)

External KBT2 (CN7)

Keyboard connector (J4)

Touchscreen connector (J5)
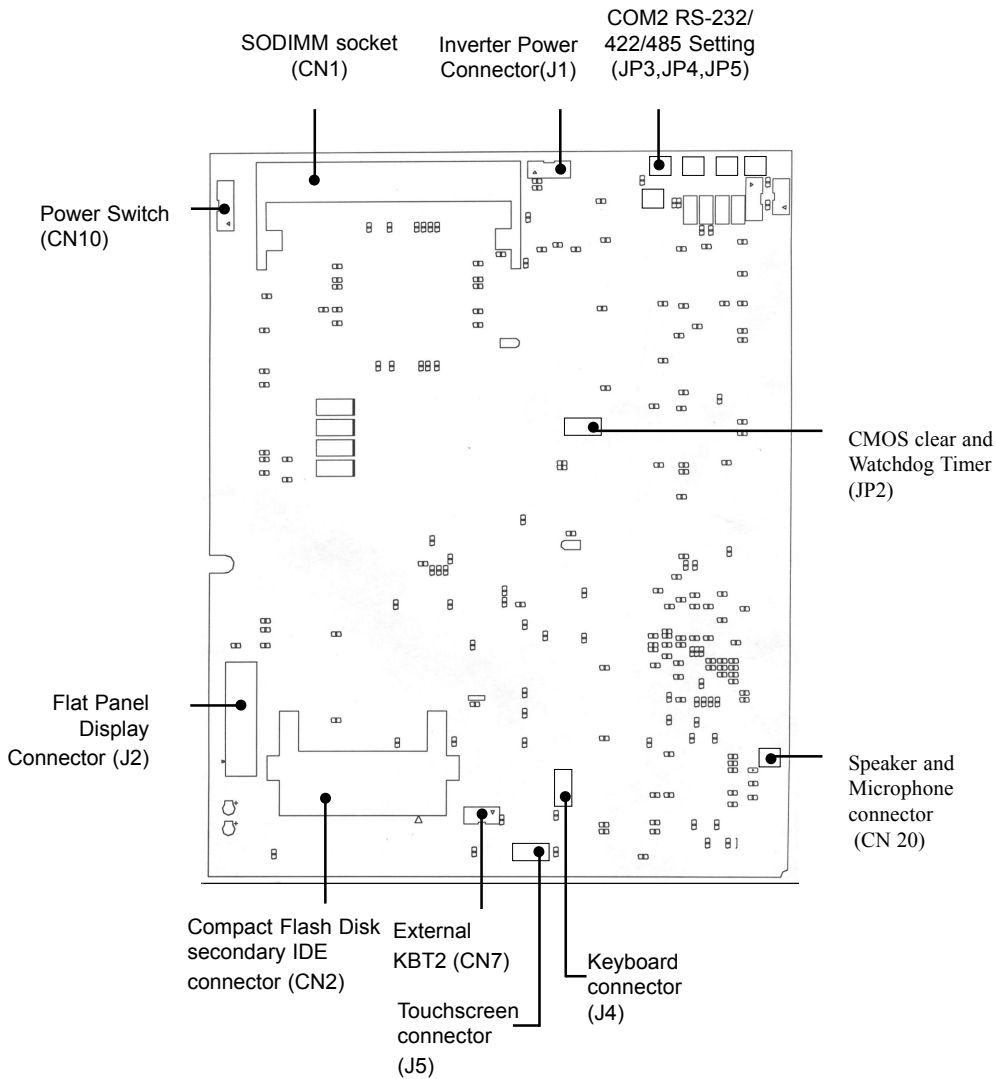
Figure 3-2: Locating jumpers and connectors PCM-5821 (rear side)

3.4   Wake on LAN Selection (Reserved) (JP1)

The PCM-5821 provides Wake-on LAN function when ATX power is used. To enable Wake-on LAN function, the JP1 should be set as shown below:

Table 3-3: Wake-on LAN selection (JP1)

*Normal Power	Wake-on LAN
1 ⊙ ⊙ 2 3 ⊙ ⊙ 4 5 ○ ○ 6	1 ○ ○ 2 3 ⊙ ⊙ 4 5 ⊙ ⊙ 6

* default setting

3.5   CMOS Clear (JP2)

Warning: *To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS". Set the jumper back to "Normal operation" before turning on the power supply.*

Table3-4: Clear CMOS/External RTC (JP2)

*Normal operation	Clear CMOS
1 3 5 ⊙ ⊙ ○	1 3 5 ○ ⊙ ⊙

* default setting

3.6   Watchdog Timer Configuration

An onboard watch timer reduces the chance of disruptions which EMP (electromagnetic pulse) interference can cause. This is an invaluable protective device for standalone or unmanned applications. Setup involves one jumper and running the control software. (Refer to Appendix A.)

3.6.1   Watchdog activity selection (JP2)

When the watchdog timer activates (i.e. CPU processing has come to a halt), it can reset the system or generate an interrupt on IRQ11. This can be set via jumper JP2 as shown below:

Table3-5: Watchdog activity selection (JP2)

System reset	IRQ11

* default setting

3.7   COM2 RS-232/422/485 setting (JP3, JP4,JP5)

COM2 can be configured to operate in RS-232/422/485 mode. This is done via JP3,JP4,and JP5.

Table 3-6: COM2 RS-232/422/485 setting (JP3, JP4)

*RS-232		RS-422/485	
JP4		JP4	
JP3		JP3	

* default setting

Table 3-7: COM2 RS-232/422/485 setting (JP5)

*RS-232	RS-422	RS-485

*default setting

3.8 Buzzer enable (JP10)

Table 3-8: Buzzer enable (JP10)

*Enable	Disable

* default setting