

# **4C61A MANUAL**

Rev 1.2



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# GENERAL

## DESCRIPTION

The 4C61A is a high performance, highintegration 5X86 based PC/104 CPU card. The 4C61A has built-in 10/100 Base T Ethernet, SVGA video, and TFT LCD support, and on card IDE flash drive.

The built in video shares system memory (UMA) for low cost and high performance. The built-in SVGA/TFT video supports resolutions upto 1024x768 by 24 bits and video memory sizes from 512K to 4096K. The built-in SVGA video can be disabled if desired.

System memory can be 32M or 64M bytes. depending on 4C61A model. System memory is 64 bits wide for high performance.

A 16M to 128M byte IDE flash drive is built into the 4C61A. Since the built-in flashdrive is IDE compatible, no special drivers are needed, regardless of operating system. An external IDE interface is also provided. IDE interfaces are PCI based or high performance.

Standard I/O include two 16C550 compatible RS-232 serial ports. One of the ports can be configured for RS-485 type interface. A bi-directional EPP/ECP/IEEE1284 compliant parallel port is provided, as are a standard battery backed clock calendar, 2 USB ports, keyboard interface and a PS/2 type mouse interface. A high performance National Semiconductor DP83815/16 PCI based 10/100 Base T Ethernet interface provides network connectivity.

The 4C61A's watchdog timer and EEPROM BIOS setup storage make the 4C61A well suited to embedded applications.

# HARDWARE CONFIGURATION

## WATCHDOG

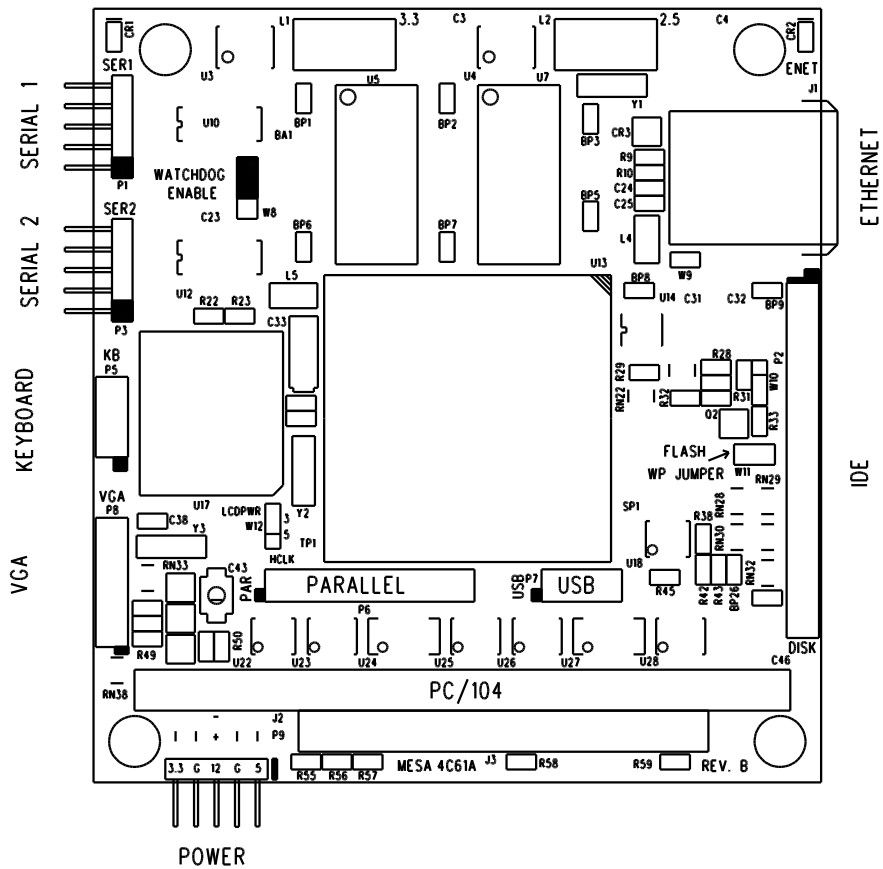
There are two jumper selectable options on the 4C61A card, The watchdog enable. And the local flash Drive Write Protect.

The watchdog is a hardware timer in the reset circuitry of the 4C61A that will reset the 4C61A if not periodically serviced. This is normally serviced by the BIOS in DOS mode. It will probably have to be disabled for other operating systems unless provision is made for servicing it. Three pin jumper W8 enables or disables the watchdog. When W8 is on the up position, the watchdog is enabled. When W8 is in the down position, the watchdog is disabled.

The on card flash drive can be write protected by installing jumper W11. This will prevent any change to the drive contents, that is the drive will become read-only. Note that this may cause problems with some operating systems if they try to write to the drive.

# CONNECTORS

## CONNECTOR AND JUMPER LOCATIONS



# CONNECTORS

## POWER CONNECTOR

The power connector P9 supplies 5V, +- 12V and optionally +3.3V power to the 4C61A. 3.3V power is normally generated on the 4C61A card and the 3.3V connections should be left unconnected. +12V and -12V power are not used by the 4C61A card but are routed to the ISA connectors. P9 is a 10 pin .1" header. The power connector pinout is as follows:

<b>PIN</b>	<b>FUNCTION</b>
<b>1</b>	<b>+5V</b>
<b>2</b>	<b>+5V</b>
<b>3</b>	<b>GND</b>
<b>4</b>	<b>GND</b>
<b>5</b>	<b>-12V</b>
<b>6</b>	<b>+12V</b>
<b>7</b>	<b>GND</b>
<b>8</b>	<b>GND</b>
<b>9</b>	<b>3.3V</b>
<b>10</b>	<b>3.3V</b>

# CONNECTORS

## KB & RESET CONNECTOR

P5 is the keyboard, mouse, speaker and CPU reset connector. P5 is a 10 pin 2mm header. A keyboard adapter is available from MESA - the KBADPT. P5 pinout is as follows:

<b>PIN</b>	<b>FUNCTION</b>
<b>1</b>	<b>SPEAKER OUT</b>
<b>2</b>	<b>SPEAKER COMMON (VCC)</b>
<b>3</b>	<b>RESET IN</b>
<b>4</b>	<b>RESET COMMON (GND)</b>
<b>5</b>	<b>MOUSE CLOCK</b>
<b>6</b>	<b>KB CLOCK</b>
<b>7</b>	<b>KB DATA</b>
<b>8</b>	<b>MOUSE DATA</b>
<b>9</b>	<b>KB COMMON (GND)</b>
<b>10</b>	<b>KB POWER (VCC)</b>



# CONNECTORS

## SERIAL CONNECTORS

P1 and P3 are standard COM1 and COM2 type serial ports. P1 is normally COM1 and P3 COM2. P1 and P3 are 10 pin .1" headers that match standard AT type DB9 pin serial ports when terminated to IDC type 9 pin connectors. In this case pin 10 is not used. Pin 10 is connected to +5V to support RS232-RS422 adapters etc. P1 and P3 pinout is as follows:

HEADER PIN	DB9 PIN	FUNCTION	DIR
1	1	DCD	IN
2	6	DSR	IN
3	2	RXD	IN
4	7	RTS	OUT
5	3	TXD	OUT
6	8	CTS	IN
7	4	DTR	OUT
8	9	RI	IN
9	5	GND	
10	XX		

# CONNECTORS

## PRINTER CONNECTOR

P6 is a standard bi-directional printer port. P6 is a 26 pin 2mm header. An adapter is available from MESA to convert this to a standard DB25F connector or a .1" 26 pin header. P6 connector pinout is as follows:

PIN	FUNCTION	PIN	FUNCTION
1	/PSTB	13	PD5
2	/PAFD	14	GND
3	PD0	15	PD6
4	/PERROR	16	GND
5	PD1	17	PD7
6	/PINIT	18	GND
7	PD2	19	/PACK
8	/PSLIN	20	GND
9	PD3	21	PBUSY
10	GND	22	GND
11	PD4	23	PPE
12	GND	24	GND
		25	PSLCT

# CONNECTORS

## VGA CONNECTOR

P8 is the VGA out connector. This is a 16 pin 2mm connector. An adaptor is supplied with the 4C61A to convert this to a standard 15 pin high density D connector. P8 pinout is as follows:

HEADER PIN	DH15 PIN	FUNCTION
1	1	RED
2	10	GND
3	2	GREEN
4	5	GND
5	3	BLUE
6	6	GND
7	7	GND
8	12	DDC0
9	8	GND
10	13	HSYNC
11		GND
12	14	VSYNC
13		GND
14	15	DDC1
15		GND
16	9	VCC

# CONNECTORS

## IDE CONNECTOR

P2 is a standard 44 pin laptop type IDE connector. This connector will work with laptop type drives, or the Mesa CFADPT adapter directly. An adapter is available from MESA (the IDEADPT) to convert the 44 pin 2mm to standard 40 pin .1" header for larger drives.

## USB CONNECTOR

P7 is the USB connector. It is a 10 pin 2mm connector. An adapter is available from MESA (the USBADPT) to convert the 10 pin 2mm connector to dual type A USB connectors. P7 pinout is as follows.

HEADER PIN	USB CHAN-PIN	FUNCTION
1	xx	GND
2	1-1	USB1PWR
3	1-2	USB1-
4	1-3	USB1+
5	1-4	GND
6	2-1	USB2PWR
7	2-2	USB2-
8	2-3	USB2+
9	2-4	GND
10	xx	GND

# CPU OPERATION

## SETUP STORAGE

All 4C61A setup options are stored in EEPROM so that CPU operation does not depend on the clock/calendar battery. The supplied utility SET4C61 allows the setup options to be changed. Setup options are changed by editing the 4C61.CF file from the distribution disk. 4C61.CF is a plain ASCII text file with the setup options. Once the desired changes are made in the 4C61.CF file, you run the utility SET4C61 with 4C61.CF as a command line argument:

```
SET4C61 4C61.CF
```

This will write the setup options specified in the 4C61.CF file to the permanent EEPROM storage on the 4C61A card.

## RECOVERING FROM SETUP PROBLEMS

It is possible to change the EEPROM setup on the 4C61A in such a manner that it becomes impossible to boot. If this happens, you can recover by invoking the default setup. This is done by holding the right shift key down when the system is reset or, if no keyboard is used, grounding the keyboard clock line. The BIOS will respond with 9 beeps, indicating that the default setup values are being used. The SET4C61 utility should now be run to fix the setup problem before the system is reset or rebooted.

## VGA OPERATION

The 4C61A has built in VGA interface that supports resolutions from standard VGA (640X480) up to 1024X768 by 24 bits. VGA memory can be selected from 256K up to 4M bytes. The VGA interface shares system memory so you will lose the programmed amount of video RAM from system memory. Higher resolution displays will also slow the 4C61A down slightly as the video accesses steal memory bandwidth from the CPU. The on card VGA can be disabled in the EEPROM setup if it is not required. This will save both memory and power.

## ON CARD IDE DRIVE

The 4C61A has a built-in IDE flash drive. This flash drive can have a capacity of 16 to 128M bytes. The on card IDE drive is located on the secondary channel. Since the on card drive is a true IDE flash drive, no special drivers are needed for any operating system.

## ETHERNET

The 4C61A has an optional on card 10/100 BaseT Ethernet interface. This interface uses the National DP83815 or DP83816. Drivers are available for Windows, DOS, Linux, \*BSD, and many other operating systems. The Ethernet address is printed on a label attached to the PC/104 connector.

# CPU OPERATION

## LOCAL I/O

The 4C61A card uses some local I/O for various low level hardware control. Please make sure that external I/O cards do not overlap these addresses: 0x200 --> 0x20F.

The local I/O bits are as follows:

### LOCAL PORTA @ 0x206H

BIT0	EEPROM DATA OUT
BIT1	EEPROM DATA IN
BIT2	EEPROM CLOCK
BIT3	EEPROM CHIPSELECT
BIT4	ROMPAGE (BIOS ROM A18)
BIT5	FEEDWATCHDOG
BIT6	/EXTRESET (RESETS HARD DRIVE)
BIT7	/LED

### LOCAL PORT B @ 0x20EH

BIT0	KBCLK
BIT1	KBDATA
BIT2	LCD CONN EXT0
BIT3	LCD CONN EXT1

# SPECIFICATIONS

	MIN	MAX
POWER SUPPLY	4.5V	5.5V
POWER CONSUMPTION:		
ACTIVE 133MHz	----	1400 mA
SLEEP MODE	----	400 mA
OPERATING TEMP.	0°C	+70°C
OPERATING TEMP. (-I version)	-40°C	+85°C
OPERATION HUMIDITY	0	95% NON-CONDENSING