integration with integrity

330420 User's Manual

5.25" Embedded Controller with Socket 237 for Intel 486 Processor

Version 1.0

CONTENTS

Chapter-1

General Information

The 3304220 is an all-in-one half size industrial single board with design in Novell NE2000 compatible 32-bit PCI bus Ethernet, provides 100 BASE-T or 10 BASE-T for directly network automation demand.

Supports for various 40-133 MHz 80486SX/DX/DX2/DX4, 5x86 CPUs with 32-bit data bus and processing ability. Up to 64MB RAM by 72-pin SIMM supported. Provides "DiskOnChip? " socket supported memory size up to 24 MB.

Design in with o n board 1MB memory VGA architecture, supports direct interface to color and monochrome Single Drive (SD) and Dual Drive (DD) STN, TFT & EL panels and resolutions up to 1024x768 256 colors to CRT monitor.

The 3304220 support completed with all necessary I/O for industrial application. A PCI enhanced IDE for two ATA-2 IDE drivers; supports up to two floppy disk drivers; provide three high speed serial RS-232 ports and one RS232/422/485 port with compatible to 16C550 UART with 16-byte FIFO; one enhanced bi-directional parallel port which support SPP/EPP/ECP. The board also provides keyboard and PS/2 mouse connector, PC/104 connector and one standard PCI slot etc.

1.1 Major Features

- 80486SX/DX/DX2/DX4, 5x86 CPU supported.
- ALi 1487/1489 chipset.
- Supports DRAM up to 64 MB.
- Fast PCI enhanced IDE controller supports two IDE drives.
- Three high-speed serial RS-232 ports and one RS232/422/485 selectable port (supports 16C550 UART with 16-byte FIFO).
- One enhanced bi-directional parallel port supports SPP/EPP/ECP.
- Keyboard and PS/2 Mouse connector.
- On-board ALi M5113 Super I/O.
- On-board 32 bit PCI-BUS VGA/ Panel controller.
- "DiskOnChip™ " Socket Supported Memory Size up to 24 MB.
- On-board 32 bit PCI bus Ethernet, Novell NE2000 compatible.
- Supports PC/104 connector.
- One standard PCI slot.

1.2 Specifications

- **CPU:** 80486SX/DX/DX2/DX4/5X86.
- **Bus interface:** PCI bus
- **Chipset:** ALi 1487/1489
- **Data bus:** 32-bit
- **Processing ability:** 32-bit
- **PCI Flat Panel / VGA Controller:** VGA Chipset with 1 MB memory interface to color and monochrome Single Drive (SS) and Dual Drive (DD) STN, TFT & EL panels. Support CRT resolutions up to 1024x768 256 colors.
- **PCI Enhanced IDE interfaces:** Supports up to two enhanced IDE ATA-2).
- **RAM memory:** Up to 64MB, uses two 72-pin SIMM sockets.
- **Cache memory:** On board 128KB 2nd level cache.
- **Floppy disk drive interface:** Supports up to two floppy disk drives.
- **Parallel port:** One parallel port supports SPP/ECP/EPP.
- **Serial port:** Three RS-232/422/485 port supports 16C550 UART with 16-byte FIFO.
- **BIOS:** AWARD flash BIOS.
- **Watchdog timer:** Hardware circuit can be set by 1, 2, 10, 20, 110, or 220 seconds period Reset or NMI was generated when CPU did not periodically trigger the timer.
- **Ethernet:** Realtek RTL 8139, 32 bit PCI bus Ethernet, Novell NE2000 compatible.
- **Keyboard / Mouse connector:** 8-pin connector supports standard PC/AT keyboard and a PS/2 mouse.
- **PC/104:** 104-pin connector support 16 bit ISA Bus.
- **PCI slot:** Standard PCI bus expansion slot.
- **Flash memory Disk:** Reserved socket for "DiskOnChip™ ", support up to 24MB Flash memory disk.

- **Power connector:** Support 4-PIN power connector input (+5V, +12V).
- **CMOS:** Real-time clock/calendar and battery backup by DS12B887 or equivalent device.
- **Power supply voltage:** +5V±5%, +12V±5%.
- **Max. Power requirement:** +5V @2.2A.
- **Operating temperature:** 0-55°C (CPU need cooler).
- **Board size:** 8" (L) x 5.75" (W) (203mm x 146mm).

1.3 Delivery Package

The delivery package of 3304220 includes all following items:

- 3304220 Industrial Single Board
- Printer port Flat Cable
- IDE port Flat Cable
- FDD port Flat Cable
- 40-pin COM ports Cable
- Flat Panel Cable
- Front Panel Cable
- Ethernet Cable
- PS/2 Mouse and Keyboard Transfer Cable
- Utility Diskette
- User's Manual

Please contact with your dealer if any of these items are missing or damaged when purchasing. And please keep all parts of the delivery package with packing materials in case of you want to ship or store the product in feature.

Chapter-2

Hardware Installation

This chapter provides the information on how to install the hardware of 3304220. At first, please follow up sections 1.3, 2.1 and 2.2 in check the delivery package and carefully unpacking. Following after, the jumpers setting of switch, watchdog timer, and the DiskOnChip? address selection.

2.1 Caution of Static Electricity

The 3304220 has been well package with a anti-static bag in protect its sensitive computer components and circuitry from the damage of static electric discharge.

Note: DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.

You should follow the steps as following to protect the board in against the static electric discharge whenever you handle the board:

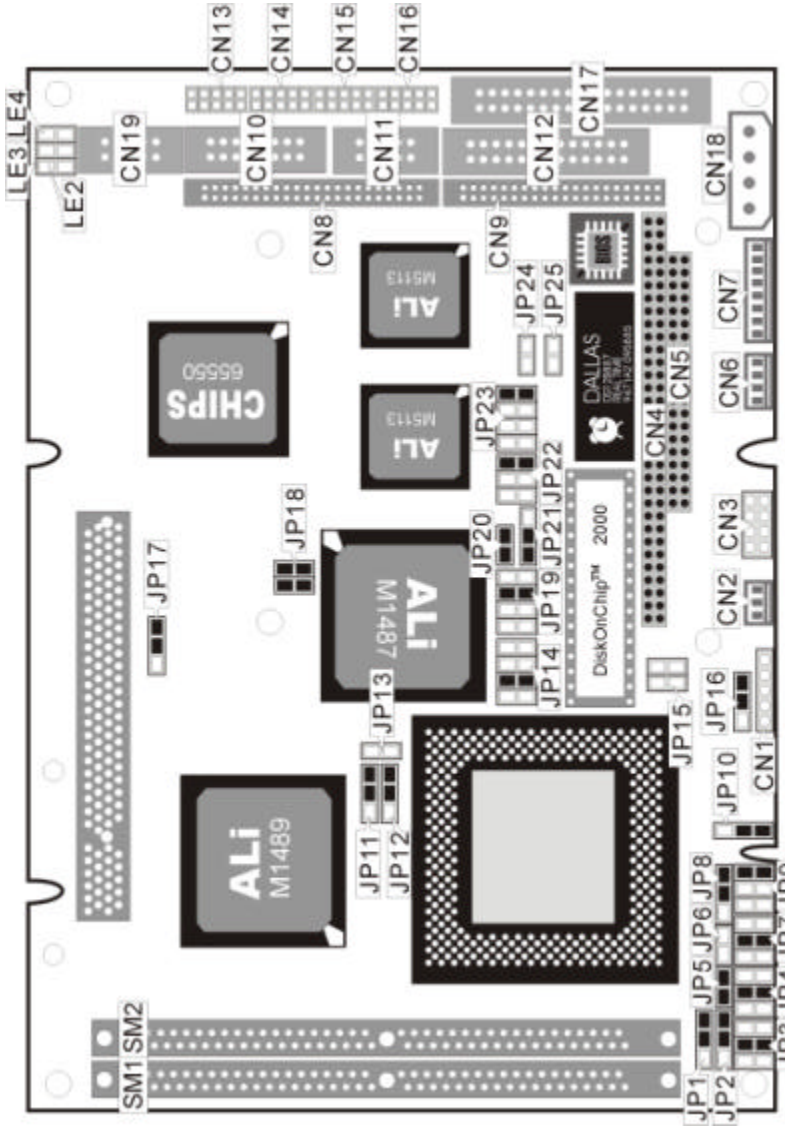
1. Please use a grounding wrist strap on whoever needs to handle the 3304220. Well clip the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please put on and connect the strap before handle the 3304220 for harmlessly discharge any static electricity through the strap.
2. Please use anti-static pad for put any components or parts or tools on the pad whenever you work on them outside the computer. You may also in use the anti-static bag instead the pad. Please ask from your local supplier in help up your necessary parts on anti-static requirement.

2.2 Caution on Unpacking and Before Installation

First of all, please follow with all necessary steps of section 2.1 in protection the 3304220 from electricity discharge. With refer to section 1.3, please check the delivery package again with following steps:

1. Unpacking the 3304220, keep well storage of all packing material, manual and diskette etc. if has.
2. Is there any components lose or drop from the board? DO NOT INSTALL IF HAPPENED.
3. Is there any visual damaged of the board? DO NOT INSTALL IF HAPPENED.
4. Well check from your optional parts (i.e. CPU, SRAM, DRAM, ROM-Disk etc.) for completed setting all necessary jumpers setting to jumper pin-set and CMOS setup correctly. Please also reference to all information of jumpers setting in this manual.
5. Well check from your external devices (i.e. Add-On-Card, Driver Type etc.) for completed add-in or connection and CMOS setup correctly. Please also reference to all information of connector connection in this manual.
6. Please keep all necessary manual and diskette in a good condition for your necessary re-installation if you change your Operating System or whatever needs.

2.3 3304220 Layout



2.4 Quick Listing of Jumpers

JP1, 2, 3, 4, 5, 7, 8, 9, 10	—	for CPU type setting
JP6	—	**for AMD CPU type selection**
JP11, 12	—	for Cache size setting
JP13	—	**CPU clock selection**
JP14	—	for DiskOnChip™ address setting
JP15	—	CPU's Vcore voltage level selection setting
JP16	—	CPU's operating voltage selection setting
JP17	—	PCI clock setting
JP18	—	CPU Clock-in selection
JP19	—	WATCH-DOG Time-out period selection
JP20	—	**PS/2 Mouse IRQ selection**
JP21	—	WATCH-DOG Active selection
JP22	—	RS422/485 Receiver Enable Control
JP23	—	RS422/485 Transceiver Enable Control
JP24	—	COM4 Enable/Disable setting

2.5 Quick Listing of Connectors

CN1:	POWER LED/KEYLOCK
CN2:	FAN CON
CN3:	FRONT PANEL
CN4:	PC104-64
CN5:	PC104-40
CN6:	POWER CONNECTOR (-12V, -5V)
CN7:	KEYBOARD + MOUSE CONNECTOR
CN8:	FLAT PANEL PORT
CN9:	HDD (IDE) CONNECTOR
CN10:	VGA CONNECTOR
CN11:	RS422/RS485
CN12:	PARALLEL PORT

CN13: COM1

CN14: COM2

CN15: COM3

CN16: COM4

CN17: FDD CONNECTOR

CN18: POWER CONNECTOR

CN19: ETHERNET CONNECTOR

2.6 Jumper Setting Description

A jumper pin-set is **ON** as a shorted circuit with a plastic cap inserted over two pins. A jumper pin-set is **OFF** as a open circuit with a plastic cap inserted over one or no pin(s) between pins. The below figure 2.2 shows the examples of different jumper pin-set setting as **ON** or **OFF** in this manual.

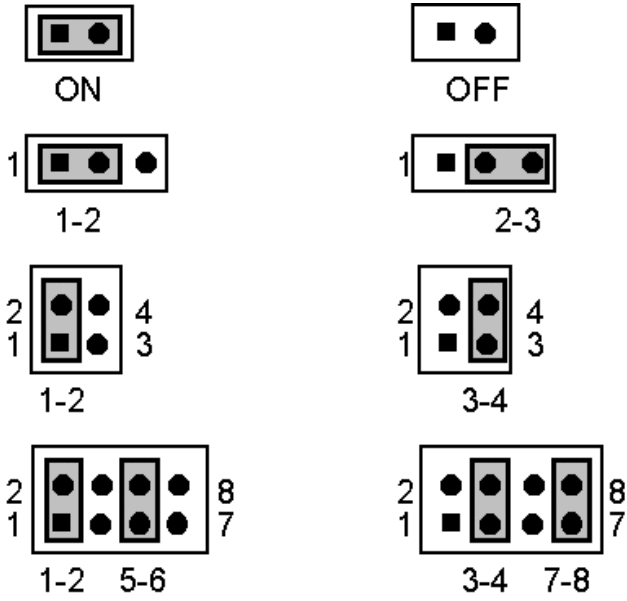


Figure 2.2

All jumper pin-set already has its default setting with the plastic cap inserted as ON, or without the plastic cap inserted as OFF. The default setting may reference in this manual with a " * " symbol in front of the selected item.

2.7 Setting the CPU of 3304220

The 3304220 provides all possibility in jumper setting for wide using all types of 486 series CPU with JP1, JP2, JP3, JP4, JP5, JP7, JP8, JP9 and JP10 setting as following:

✍ **CPU Clock Setting**

CPU	JP1	JP2	JP3	JP4	JP5	JP7	JP8	JP9	JP10
1.IntelDX4™	OFF	1-2	3-4	3-4	ON	3-4	2-3	OFF	2-3
***2.Cyrix 5x86**	**2-3**	**2-3**	**3-4**	**3-4**	**ON**	**3-4**	**2-3**	**5-6**	**2-3**
3.AMD DX4 + (SV8B)	2-3	2-3	3-4	3-4	ON	3-4	2-3	5-6	2-3
4.Cyrix/TI/SGS DX2/DX4	1-2	1-2	5-6	5-6	ON	5-6	2-3	1-2	2-3
5.AMD DX/DX4 (NV8T)	OFF	1-2	1-2	OFF	OFF	OFF	2-3	OFF	2-3
6.AMD DX2+ (SV8B)	2-3	2-3	3-4	3-4	ON	3-4	2-3	1-3,5-6	2-3
7.AM5x86 P75 (133MHz)	2-3	2-3	3-4	3-4	ON	3-4	2-3	1-3,5-6	2-3

Correspond to different type CPU, it is request to set JP15 and JP16 for match the CPU operating voltage. Here shows at below of the proper jumper settings for their respective Vcc.

✍ **CPU power supply select**

JP15	DESCRIPTION
1-2, 3-4	5V
***ALL OFF**	**3V**

JP16	DESCRIPTION
1-2	3.45V
***2-3**	**3.3V**

For AMD type CPU, please set correctly of JP6 as following. For others, please keep JP6 at **OFF** setting.

✍ **AMD CPU type select**

JP6	DESCRIPTION
ON	AMD DX2
***OFF**	**AMD DX4**

JP18 used to synchronize the CPU clock with the CPU type. Please set the CPU clock with JP18, JP13 and JP17 jumpers according to the base CPU speed.

✍ **CPU clock select**

JP18	JP13	JP17	DESCRIPTION
OFF, OFF	OFF	1-2	25 MHz
***1-2, 3-4**	**OFF**	**1-2**	**33 MHz**
OFF, 3-4	ON	2-3	40 MHz
1-2, OFF	ON	2-3	50 MHz

2.8 CMOS Data Clear

The JP25 provides a hardware CMOS data clear function with an **ON** to it. *Never clear CMOS data during power on in case of damage the sensitive electronic components or the board.*

✍ **CMOS Data Clear**

JP25	DESCRIPTION
ON	Clear Data
***OFF**	**Normal**

2.9 Cache Size Select

The 3304220 design in with a wide ranges Cache Size architectures to meet all different costs request. The standard specification is 32K x 8.

✍ **Cache Size select**

JP11	JP12	DESCRIPTION
*** 2-3**	*** 2-3**	*** 32K x 8**
1-2	2-3	64K x 8
1-2	1-2	128K x 8

2.10 System Memory DRAM

The 3304220 provides a wide range on-board DRAM memory sizes from 1 MB to 16 MB by using 1, 2, 4, 8 or 16MB 72-pin SIMMs (Single In-Line Memory Modules) with access time should be 70 n-second or faster.

The 3304220 provides two banks for memory installation by SIMM RAM module on card. The banks are designated as Bank0 and Bank1. See the figure on section 2.3 for get the identifying the banks. You must use from Bank0 first if install one SIMM only. If you are using both banks, the memory capacity of both SIMMs should be the same.

2.11 Watch-Dog Timer

There are three access cycles of Watch-Dog Timer as Enable, Refresh and Disable. The Enable cycle should proceed by READ PORT 443H. The Disable cycle should proceed by READ PORT 043H. A continue Enable cycle after a first Enable cycle means Refresh.

Once if the Enable cycle activity, a Refresh cycle is request before the time-out period for restart counting the WDT Timer's period. Otherwise, it will assume that the program operation is abnormal when the time counting over the period preset of WDT Timer. A System Reset signal to start again or a NMI cycle to the CPU comes if over.

The JP21 is using for select the active function of watch-dog timer in disable the watch-dog timer, or presetting the watch-dog timer activity at the reset trigger, or presetting the watch-dog timer activity at the NMI trigger.

JP21 : Watch-Dog Active Type Setting

JP21	DESCRIPTION
***1-2**	**System Reset**
2-3	Active NMI
OFF	disable Watch-dog timer

JP19 : WDT Time - Out Period

PERIOD	1-2	3-4	5-6	7-8
***1 sec**	**OFF**	**OFF**	**ON**	**OFF**
2 sec	OFF	OFF	ON	ON
10 sec	OFF	ON	OFF	OFF
20 sec	OFF	ON	OFF	ON
110 sec	ON	OFF	OFF	OFF
220 sec	ON	OFF	OFF	ON

The Watch-dog timer is disabled after the system Power-On. The watch-dog timer can be enabled by a Enable cycle with reading the control port (443H), a Refresh cycle with reading the control port (443H) and a Disable cycle by reading the Watch-dog timer disable control port (043H). After a Enable cycle of WDT, user must constantly proceed a Refresh cycle to WDT before its period setting comes ending of every 1, 2, 10, 20, 110 or 120 seconds. If the Refresh cycle does not active before WDT period cycle, the on board WDT architecture will issue a Reset or NMI cycle to the system.

The Watch-Dog Timer is controlled by two I/O ports.

443H	I/O Read	The Enable cycle.
443H	I/O Read	The Refresh cycle.
043H	I/O Read	The Disable cycle.

The following sample programs showing how to Enable, Disable and Refresh the Watch-dog timer:

```
WDT_EN_RF       EQU     0443H
WDT_DIS         EQU     0043H

WT_Enable       PUSH    AX              ; keep AX DX
                PUSH    DX
                MOV     DX,WDT_EN_RF    ; enable the watch-dog timer
                IN      AL,DX
                POP     DX              ; get back AX, DX
                POP     AX
                RET

WT_Rresh        PUSH    AX              ; keep AX, DX
```

```
                PUSH    DX
                MOV     DX,WDT_ET_RF    ; refresh the watch-dog timer
                IN      AL,DX
                POP     DX              ; get back AX, DX
                POP     AX
                RET

WT_DISABLE      PUSH    AX
                PUSH    DX
                MOV     DX,WDT_DIS      ; disable the watch-dog timer
                IN      AL,DX
                POP     DX              ; get back AX, DX
                POP     AX
                RET
```

2.12 VGA Controller

The C&T 655xx family supports a wide variety of monochrome and color Single-Panel, Single-Drive (SS) and Dual-Panel, Dual Drive (DD) standard and high-res passive STN and active matrix TFT/MIN LCD, and EL panels. For monochrome panels, up to 64 gray scales are supported. Up to 4096 different colors can be displayed on passive STN LCDs and up to 16 M co lors on 24-bit active matrix LCDs.

The 3304220 uses C&T 65550 chipset. Provides 2.0 mm pitch 44-pin on-board internal connector for flat panel connection; and a external DB15 analogy R.G.B. output connector for CRT monitor. By BIOS setup, user may use one of the display devices or both. Please use at the same resolution when both display. Please contact with your dealer if connection to a new specification flat panel.

The 3304220 offers a variety of programmable features to optimize display quality. Vertical centering and stretching are provided for handling modes with less than 480 lines on 480 - line panels. Horizontal and vertical stretching capabilities are also available for both text and graphics modes for optimal display of VGA text and graphics modes on 800x600 and 1024x768 panels.

2.13 DiskOnChip? Address Setting

The 3304220 provides a U8 socket for install the DiskOnChip? module.

A JP14 may select the starting memory address of the DiskOnChip? (D.O.C.) for avoid the mapping area with any other memory devices. If you have another extra memory devices in the system with the same memory, neither the 3304220 nor the extra memory devices will function normally. Please setting both at different memory address mapping.

✍ **JP14 : DiskOnChip? Address**

PIN NO.	Address
***1-2**	**D000**
3-4	D800
5-6	E000
7-8	E800

*) : default setting

The D.O.C. function allows the system in using without FDD nor HDD. The D.O.C. may formatting as driver C: or driver A:. User may also easily uses the DOS's commands such as FORMAT, SYS, COPY, XCOPY, DISCOPY and DISKCOMP etc. This is means that the D.O.C. may uses as driver-A if the system without FDD-A for ambient application. Please contact with your supplier for different size D.O.C. module.

Chapter-3

Connection

This chapter gives all necessary information of the peripheral's connections, switches and indicators.

3.1 The Floppy Disk Drive Connector

A standard 34-pin header daisy-chain driver connector provides as CN17 with following pin assignment. Total two FDD drivers may connect.

CN17 : FDD CONNECTOR

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE DATA#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT
33	GROUND	34	DISK CHANGE#

3.2 PCI E-IDE Drive Connector

A standard 40-pin header daisy-chain driver connector provides as CN9 with following pin assignment. Total two IDE (Integrated Device Electronics) drivers may connect.

✍ **CN9(IDE 1) : Primary IDE Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND# -DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0	38	HDC CS1#
39	HDD ACTIVE	40	GROUND

3.3 Parallel Port Connector

A standard 26-pin flat cable driver connector provides as CN12 with following pin assignment for connection to parallel printer.

CN12 : Parallel Port Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	GROUND

3.4 Serial Ports Connectors

The 3304220 CN13, 14, 15 and 16 headers provides four high speeds NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports. Please see the following pin assignment. With the delivery package, user may uses the 40-pin COM cable for plug into CN13, 14, 15 and 16 for get COM1 to COM4 connection. The pin number inside the ( ) are for 40-pin cable.

CN13, 14, 15, 16 : Serial Port 10-pin Headers (COM1~COM4)

COM Port	PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM 1 (CN13)	1(1)	DCD	2(2)	DSR
	3(3)	RXD	4(4)	RTX
	5(5)	TXD	6(6)	CTX
	7(7)	DTR	8(8)	RI
	9(9)	GND	10(10)	NC
COM 2 (CN 14)	1(11)	DCD	2(12)	DSR
	3(13)	RXD	4(14)	RTX
	5(15)	TXD	6(16)	CTX
	7(17)	DTR	8(18)	RI
	9(19)	GND	10(20)	NC
COM 1 (CN15)	1(21)	DCD	2(22)	DSR
	3(23)	RXD	4(24)	RTX
	5(25)	TXD	6(26)	CTX
	7(27)	DTR	8(28)	RI
	9(29)	GND	10(30)	NC
COM 2 (CN 16)	1(31)	DCD	2(32)	DSR
	3(33)	RXD	4(34)	RTX
	5(35)	TXD	6(36)	CTX
	7(37)	DTR	8(38)	RI
	9(39)	GND	10(40)	NC

The 3304220 also provides for user in select to using the COM4 as an RS422/485. The CN16 for uses as an RS232, the CN11 for uses as an RS422 or RS485.

Please reference to the following for setting the JP22 & JP23 at disable and JP24 at enable if uses as RS232 at CN16. Or setting the JP22 & JP23 at non-disable and JP24 at disable if uses as RS422 or RS485 at CN11. The default setting is RS-232 at CN16.

✍ **CN11 : RS422/485**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	RTS-
7	RTS+	8	CTS+
9	CTS-	10	NC

✍ **JP22 : Receiver Enable Control**

JP22	DESCRIPTION
1-2	**Always Enable**
3-4	Enable by writing the REG : 2 EFH BIT1=1
*5-6	Always Disable

*) : default setting

✍ **JP23 : Transceiver Enable Control**

JP23	DESCRIPTION
1-2	**Always Enable**
3-4	Enable by ”-RTS” signal
5-6	Enable by writing the REG : 2 EFH BIT0=1
*7-8	Always Disable

*) : default setting

✍ **JP24 : COM4 Selection**

JP24	DESCRIPTION
ON	As RS-422/485 in CN11
*OFF	As RS-232 in CN16

*) : default setting

3.5 Keyboard & Mouse Connector

The 3304220 provides a 8-pin header connector CN7 for connection to Keyboard & Mouse devices.

CN7 : 8-pin Header Keyboard Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	MS-DATA	4	MS-CLK
5	GND	6	VCC
7	KB-DATA	8	KB-CLK

3.6 Power's LED, FAN and Key-Lock Connectors

The CN1 provides both Power's LED and Key-Lock connector as following pin assignment.

CN1 : POWER LED & KEYLOCK

PIN NO.	DESCRIPTION
1	POWER LED ANODE
2	KEY
3	GROUND
4	KEYLOCK
5	GROUND

The CN2 provides a FAN connector as following pin assignment.

CN2 : FAN CON

PIN NO.	DESCRIPTION
1	VCC
2	GROUND
3	+12V

3.7 DC Main and Aux. Power Connectors

The 3304220 provides a CN18 connector for the main DC power input connection as following pin assignment for +5V and +12V.

✍ **CN18 : POWER CONNECTOR**

PIN NO.	DESCRIPTION
1	VCC
2	GROUND
3	GROUND
4	+12V

The 3304220 provides a CN6 connector for the aux. DC power input connection as following pin assignment for -5V and -12V.

✍ **CN6 : POWER CONNECTOR**

PIN NO.	DESCRIPTION
1	-12V
2	GROUND
3	-5V
4	GROUND

3.8 External Front Panel Connector

The 3304220 has an on-board buzzer. With CN3, it allows user in connection to a external speaker, IDE's LED and Reset bottom.

✍ **CN3 : Front Panel Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	IDE-LED	2	VCC
3	SPEAKER	4	GROUND
5	GROUND	6	WATCHDOG CLEAR
7	GROUND	8	RESET

3.9 PS/2 Mouse IRQ12 Selection Connector

The 3304220 has an on-bard PS/2 mouse which using IRQ12. If you do not use the PS/2 mouse and wish to assign IRQ12 for other purposes, you should setting the JP20 to disconnect PS/2 interrupt from IRQ12.

JP20	SELECTION
OFF	No interrupt for PS/2
*ON	IRQ12

*) : default setting

3.10 VGA Connector

The 3304220 has on-board 16-pin external VGA connector.

CN10 : VGA Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GROUND
3	GREEN	4	GROUND
5	BLUE	6	GROUND
7	GROUND	8	GROUND
9	GROUND	10	HSYNC
11	GROUND	12	VSYNC
13	GROUND	14	NC
15	GROUND	16	NC

3.11 Fast Ethernet Connector

The Fast Ethernet controller provides with 32-bit performance, PCI bus master capability, and full compliance with IEEE 802.3 100Base-T specifications.

For 10/100Base-T RJ-45 operation, please connect the network connection by plugging one end of the cable into the RJ-45 to CN19 Connector.

✍ **CN19 : Ethernet Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	LED 0
3	RX+	4	RX-
5	LED 1	6	GND
7	LED 2	8	GND
9	TX+	10	TX-

3.12 PC/104 Bus Connection

The 3304220 PC/104 expansion bus provides you in connect to all kind PC/104 modules connection. The PC/104 bus has already become the industrial embedded 16-bit PC standard bus, so you can easily install to over thousands of PC/104 modules from hundreds of venders in the world. The detailed pin assignment of the PC/104 expansion bus connectors CN4 and CN5 are specified as following tables:

Note : The PC/104 connector allows to directly plug-in Stack-thru PC/104 modules without the PC/104 mounting kit.

✍ **CN4&CN5 : PC/104 Expansion Bus**

(CN4 = 64-pin female connector; CN5 = 40-pin female connector.)

Pin No.	CN4 RowA	CN4 RowB	CN5 RowC	CN5 RowD
0	--	--	0V	0V
1	IOCHECK*	0V	SBHE*	MEMCS16*
2	SD7	RESETDRV	LA23	IOSC16*
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	NOWS*	LA17	DACK0*
9	SD0	+12V	MEMR*	DRQ0
10	IOCHRDY	(KEY)	MEMW*	DACK5*
11	AEN	SMEMW*	SD8	DRQ5
12	SA19	SMEMR*	SD9	DACK6*
13	SA18	IOW*	SD10	DRQ6
14	SA17	IOR*	SD11	DACK7*
15	SA16	DACK3*	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	0V
19	SA12	REFRESH*	(KEY)	0V
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	--	--

3.13 Flat-Panel Connector

The 3304220 provides a 44-pin 2.0 mm pitch header connector (CN8) for Flat panel connection. The information here also provides some pin information samples to Panel Sharp LM64183P, LM64C35P & LM64C142 and NEC NL8060AC26.

+12V	1	2	+12V
GND	3	4	GND
PV_{CC}	5	6	PV_{CC}
FPVee	7	8	GND
P_0	9	10	P_1
P_2	11	12	P_3
P_4	13	14	P_5
P_6	15	16	P_7
P_8	17	18	P_9
P_{10}	19	20	P_{11}
P_{12}	21	22	P_{13}
P_{14}	23	24	P_{15}
P_{16}	25	26	P_{17}
P_{18}	27	28	P_{19}
P_{20}	29	30	P_{21}
P_{22}	31	32	P_{23}
GND	33	34	GND
SHFCLK	35	36	FLM
M	37	38	LP
GND	39	40	ENABKL
GND	41	42	ASHFCLK
V_{CC}	43	44	V_{CC}

Connections for four standard LCDs

Connections to Sharp LM64183P

(640 x 480 DSTN MONO LCD)

Sharp LM64P83		3304220 CN8	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	S	36	FLM
CN1-2	CP1	38	LP
CN1-3	CP2	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	VDD	6	+5V
CN1-6	VSS	3	GND
CN1-7	VEE	-	-17 V (external power)
CN1-8	DU0	12	P3
CN1-9	DU1	11	P2
CN1-10	DU2	10	P1
CN1-11	DU3	9	P0
CN1-12	DL0	16	P7
CN1-13	DL1	15	P6
CN1-14	DL2	14	P5
CN1-15	DL3	13	P4

Connections to Sharp LM64C35P

(640 x 480 DSTN Stn Color)

Sharp LM64C35P		3304220 CN8	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	DL4	16	P7
CN1-2	Vss	3	GND
CN1-3	DL5	15	P6
CN1-4	YD	36	FLM
CN1-5	DL6	14	P5
CN1-6	LP	38	LP
CN1-7	DL7	13	P4
CN1-8	Vss	4	GND
CN1-9	Vss	8	GND
CN1-10	XCK	35	SLFCHK
CN1-11	DL0	24	P15
CN1-12	Vcon	-	Contrast Adjust
CN1-13	DL1	23	P14
CN1-14	Vdd	5	+5V
CN1-15	Vss	33	GND
CN1-16	Vdd	6	+5V
CN1-17	DL2	22	P13
CN1-18	DISP	6	+5V
CN1-19	DL3	21	P12
CN1-20	NC	-	-
CN1-21	Vss	34	GND
CN1-22	DU3	17	P8
CN1-23	DU4	12	P3
CN1-24	DU2	18	P9
CN1-25	DU5	11	P2
CN1-26	DU1	19	P10
CN1-27	Vss	39	GND
CN1-28	DU0	20	P11
CN1-29	DU6	10	P1
CN1-30	Vss	39	GND
CN1-31	DU7	9	P0

Connections to NEC NL8060AC26 (800 x 600 TFT Color)

NEC NL8060AC26		3304220 CN8	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	GND	3	GND
CN1-2	Dot Clock	35	SHFCLK
CN1-3	GND	4	GND
CN1-4	Hsync	38	LP
CN1-5	Hsync	38	FLM
CN1-6	GND	8	GND
CN1-7	GND	8	GND
CN1-8	GND	8	GND
CN1-9	R0	27	P18
CN1-10	R1	28	P19
CN1-11	R2	29	P20
CN1-12	GND	8	GND
CN1-13	R3	30	P21
CN1-14	R4	31	P22
CN1-15	R5	32	P23
CN1-16	GND	39	GND
CN1-17	GND	39	GND
CN1-18	GND	39	GND
CN1-19	G0	19	P10
CN1-20	G1	20	P11
CN1-21	G2	21	P12
CN1-22	GND	39	GND
CN1-23	G3	22	P13
CN1-24	G4	23	P14
CN1-25	G5	24	P15
CN1-26	GND	41	GND
CN1-27	GND	41	GND
CN1-28	GND	41	GND
CN1-29	B0	11	P2
CN1-30	B1	12	P3
CN1-31	B2	13	P4
CN1-32	GND	41	GND
CN1-33	B3	14	P5
CN1-34	B4	15	P6
CN1-35	B5	16	P7
CN1-36	GND	41	GND
CN1-37	DE	37	M
CN1-38	PVcc	43	PVcc
CN1-39	PVcc	44	PVcc
CN1-40	PVcc	5	PVcc
CN1-41	MODE	-	---

Connections to Sharp LM64C142

(640 x 480 DSTN Stn Color)

Sharp LM64C142		3304220 CN8	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	YD	36	FLM
CN1-2	LP	38	LP
CN1-3	XCX	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	PVdd	6	+5V
CN1-6	PVss	3	GND
CN1-7	PVee	-	+27 V (external power)
CN1-8	DU0	20	P11
CN1-9	DU1	19	P10
CN1-10	DU2	18	P9
CN1-11	DU3	17	P8
CN1-12	DU4	12	P3
CN1-13	DU5	11	P2
CN1-14	DU6	10	P1
CN1-15	DU7	9	P0
CN2-1	Vss	4	GND
CN2-2	DL0	24	P15
CN2-3	DL1	23	P14
CN2-4	DL2	22	P13
CN2-5	DL3	21	P12
CN2-6	DL4	16	P7
CN2-7	DL5	15	P6
CN2-8	DL6	14	P5
CN2-9	DL7	13	P4
CN2-10	Vss	8	GND

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