

# **JUKI-510 –ISA BUS**

## **Low Power GXLV/GX1 MMX with SVGA/LCD, Ethernet, & Audio SBC.**

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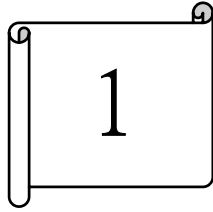
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## Introduction

JUKI-510 is designed for limited space applications with only the half size . It supports the full functions of an AT& ATX-compatible industrial computer on a single board. So it provides wake on LAN and Modem. The JUKI-510 is equipped with a low-power consumption and high performance GXLV/GX1 processor on board. It also contains an SDRAM DIMM socket that can support up to 256 MB memory.

The JUKI-510 provides an Ethernet interface, audio interface, Compact Flash Type II, EIDE interface, one parallel port, Two RS-232 serial ports, and a PS/2 keyboard/mouse interface. The built-in SVGA/LCD display controller supports both the CRT and LCD display simultaneously. It offers the resolutions of LCD screen up to 800 x 600 and CRT resolutions up to 1280 x 1024 @ 256 colors & 1024x 768 @ 16 bpp. It also provides TV-OUT interface for PAL or NTSC TV. The display type is configured by software utility. The Flash ROM contains both the system BIOS and the VGA BIOS. Reprogramming the Flash ROM could do modification, in case of necessary.

## 1.1 Specifications

### \***NS GXLV/GX1-233/266/300 MMX 32-Bit x86 Processor**

Supports Intel MMX instruction set extension for the acceleration of multi media applications

16 KB unified L1 cache

Five-stage pipelined integer unit

Integrated Floating Point Unit ( FPU )

\***System memory:** One 168-pin DIMM socket support up to 256MB SDRAM

\***BIOS:** AWARD 256 KB Flash memory

### \***Display Controller**

MediaGx processor has applied the UMA technology, which provides 1.5~4MB display memory, to be set up by BIOS

Support CRT and TFT LCD displays simultaneously

Support 18-bit TFT LCD panel resolution up to 800x600 @ 18bpp

Support non-interlaced CRT monitors resolutions up to 1280x1024 @ 256 colors & 1024x768 @ 16bpp

### \***Audio**

Compliant to AC97, support stereo

Connector: Speaker, Mic-in, Line-in, Line-out, CD-in

### \***TV-OUT**

Support both NTSC and PAL.

\***IDE interface:** The IDE support to two PCI Enhanced IDE hard drives

\***FDD interface:** support up to two floppy disk drives, 5.25" ( 360KB and 1.2MB ) and/or 3.5" ( 720KB, 1.44MB, and 2.88MB )

\***Serial ports:** two RS232 ports. (support wake on modem)

\***Parallel port:** One Parallel port, supports SPP/EPP/ECP mode

\***PS/2 Mouse/Keyboard connector:** A 6-pin mini-DIN connector for easy connection to a keyboard and PS/2

mouse

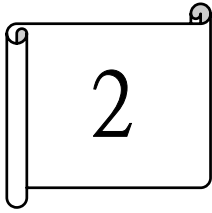
- \***USB interface:** two USB ports, USB 1.0 compliant
- \***Power management:** supports power saving modes including Normal/Doze/Sleep modes. APM1.1 compliant
- \***Watchdog timer:** can be set by 1-255 seconds period. Reset or NMI was generated when CPU did not periodically trigger the timer.
- \***10/100Mbps Ethernet Controller:** Realtek 8139C IEEE802.u 100 BASE-TX standard Dual Auto-sensing interface to 10Mbps or 100Mbps networks. On board RJ45 connectors provide for easy connection.(support wake on LAN)
- \***CompactFlash Disk:** The CompactFlash Storage Card also runs in True IDE Mode that is compatible with an IDE disk drive. It can be used with a passive adapter in a Type II socket.
- \***Power supply:** +5V @1.8A ( typical ) (+5V only)
- \***Operating temperature:** 0-60°C
- \***Dimension:** 7.27" ( L ) x4.85" ( W ) ( 185mmx122mm ) The detail dimension refer the page 8.

## 1.2 What You Have

Before you begin installing the product, please check the following materials are included in the package:

- 1 JUKI-510 All-in-one single board computer
- 1 CD disk for utility and drivers
- 1 3.5" IDE flat cable (40-pin to 40-pin 2.54mm pitch)  
(Part No:32200-000005)
- 1 standard D25 connector for parallel cable (Printer)  
(Part No:32200-000040)
- 1 serial port flat cable (RS-232 , 2.54mm pitch)  
(Part No:32200-012900)
- 1 floppy cable (for 3.5" FDD only)(Part No:32200-000017)
- 1 one to two 6pin mini Din Connector for keyboard and mouse.(Part No:32000-000138)
- 1 audio cable sets. (Part No:19800-000010)
- 1 TV AV and S-Video cable. (Part No:19800-000013)
- 1 LCD 44 Pin Connector (FP24-01A)•
- 1.serial+parallel cable(Part No:19800-000018)

If any of these items are missing or damaged, contact your distributor or sales representative immediately.



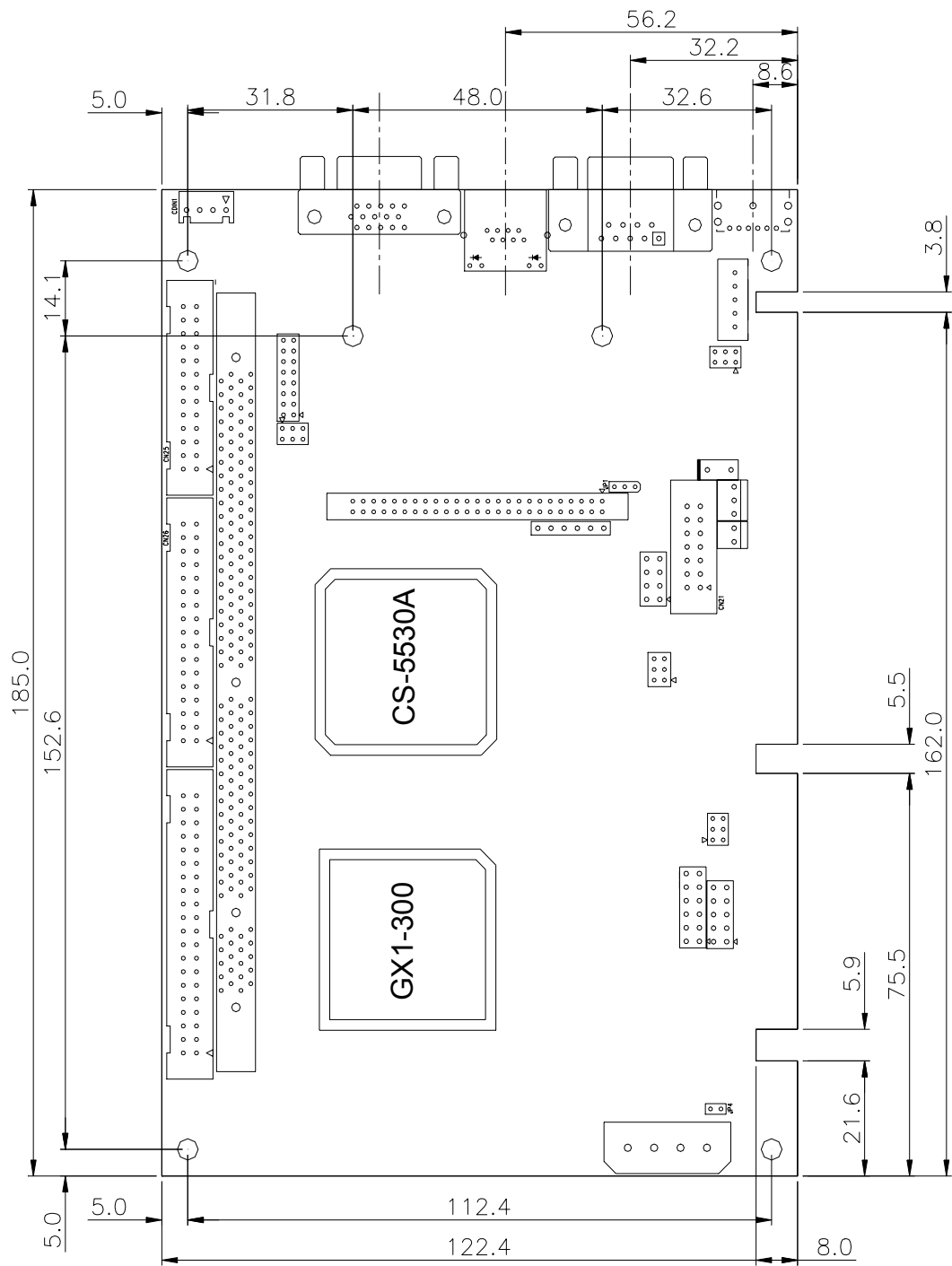
## Installation

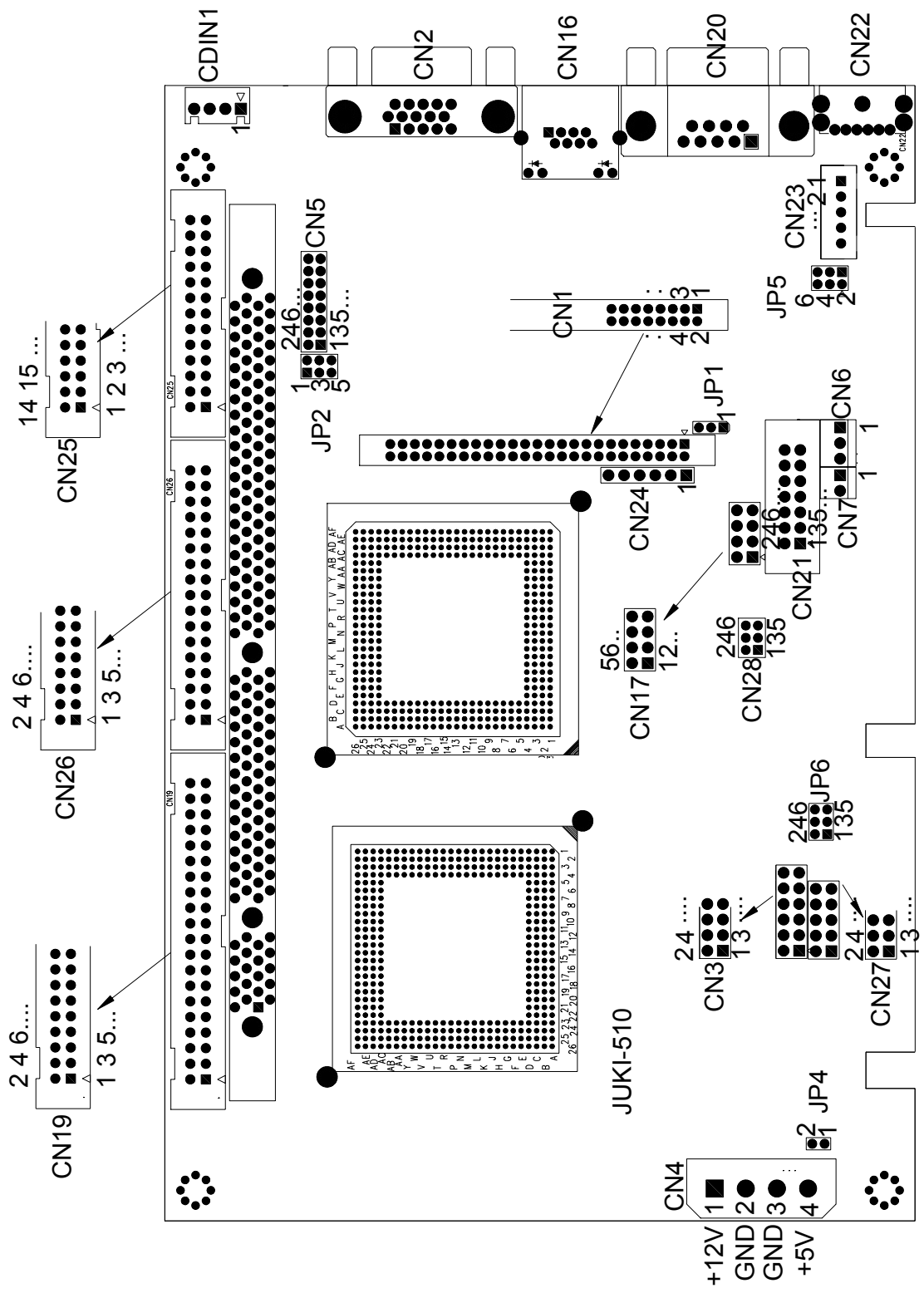
This chapter gives instructions about how to set up the JUKI-510 hardware, including directions of setting jumpers and connecting peripherals, switches and indicators. Before installation, please pay attention to the unpacking precautions on the following page for safety.

### 2.1 JUKI-510 Board Layout

Please refer the next page







## 2.2 Unpacking Precautions

Some components of JUKI-510 SBC are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to note these precautions:

Ground yourself to remove any static charge before touching the JUKI-510 SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.

Handle your JUKI-510 SBC by its edges. Don't touch IC chips, leads or circuitry if not necessary.

Do not plug any connector or jumper while the power is on.

There is one 168-pin DIMM socket to accept 3.3V non-buffered SDRAM. The max. Memory size is 256MB.

## 2.3 Watchdog Timer Setting (JP1)

Reading port 443H enables the Watchdog Timer. It should be triggered before the time-out period ends, otherwise it will assume the program operation is abnormal and will issue a reset signal to start again. The Watchdog Timer is disabled by reading port 043/843H. For detail information about Watch-Dog Timer Refer to Appendix A

- JP1 : Watchdog Active Type Setting

<b>JP1</b>	<b>DESCRIPTION</b>
<b>2-3</b>	Reset when WDT time-out
<b>OPEN</b>	Disable WDT

## 2.4 LCD Voltage and Clock Setting (JP2)

The LCD interface connector CN1 can provide 5V or 3.3V power supply by selecting the JP2 (1,3,5) to meet the different LCD requirement. And the JP2 (2,4,6) can provide normal or inverted Shift CLOCK for LCD.

JP2 (1,3,5)	DESCRIPTION
1-3	5V
<b>3-5</b>	<b>3.3V</b>

JP2 (2,4,6)	DESCRIPTION
2-4	Shift Clock (Normal)
<b>4-6</b>	<b>Shift Clock invert</b>

## 2.5 Compact Flash Setting (JP4)

Set the operating mode of CompactFlash disk

- JP4 : Compact Flash Setting

Address	JP4
MASTER	CLOSE
<b>SLAVE</b>	<b>OPEN</b>

## 2.6 COM2 Setting JP5,JP6(2,4,6)

The COM2 (CN21) can supply +5V or +12V power to the serial devices via RI pin (Pin 8) of the COM port connector. The max. current is 1A with fuse protection, from these two connector's 5V/12V output. If the output is set to 12V, make sure that you have 12V to supply to the board.

CN21 Pin 8	JP5(2,4,6)	JP5(1,3,5)
RI Signal	4-6	Don't care
+5V	<b>2-4</b>	<b>1-3</b>
+12V	<b>2-4</b>	<b>3-5</b>

## COM2 RS-232, RS-422 or RS-485 Setting JP6(2,4,6)(Optional)

The COM2 (CN21) can be set to RS-232 or RS-422/485 for industrial field site application. Moreover when this port set to the RS-485 mode the board equipped self-tuner IC will automatic sensing the data direction to eliminate the data collision. This is especially important in WINDOWS programming which do not allow the program to catch the control pin at your wish. About the RS422 and RS485 function, It's optional for customer.

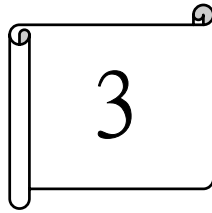
JP6(2,4,6)	DESCRIPTION
2-4	RS232
4-6	RS422/RS485

## 2.7 Clear CMOS Setup (JP6/1,3,5)

If you need to clear the CMOS Setup (for example forgot the password you should clear the setup and then set the password again.), you should close the JP6(3,5) about 3 seconds, then open it again. Set back to normal operation mode.

- JP6/1,3,5: Clear CMOS Setup (Reserve Function)

JP6(1,3,5)	DESCRIPTION
1-3	Normal Operation
3-5	Clear CMOS Setup



## Connection

This chapter describes how to connect peripherals, switches and indicators to the JUKI-510 board.

### 3.1 LCD Interface Connector (CN1)

The JUKI-510 provides a 2x25-pin connector CN1, for the LCD flat panel interface and the LVDS interface.

The JUKI-510 comes to support TFT LCD panels at following display options: (This is a reference table only, may support more type panels)

Video Display type	Resolution	Example
TFT VGA	640X480, 64K Color, 18bits	Toshiba LTM10C209A
TFT VGA	640X480, 64K Color, 18bits	PRIME VIEW P46CV1
TFT VGA	640X480, 64K Color, 18bits	NEC NL6448AC33-18
TFT SVGA	800X600, 64K Color, 18bits	IMES M121-53H
TFT SVGA	800X600, 64K Color, 18bits	Toshiba LTM12C289A
TFT SVGA	800X600, 64K Color, 18bits	Toshiba LTM12C275A
TFT XGA	1024X768,64K Color,18bits	NEC NL10276AC30-04R

The display options need to be setup manually from BIOS. The BIOS “**Integrated Peripheral**” Setup will allow you to choose display resolution either 640X480 , 800X600 or 1024X768.

LCD Interface Connector – only support up to 18 bits TFT-LCD. For better display quality, the length of LCD cable should be shorter than 35 cm.

- CN1: 50-pin LCD Connector

PIN NO.	Description	PIN NO.	Description
1	N/C	2	N/C
3	N/C	4	N/C
5	N/C	6	N/C
7	N/C	8	N/C
9	N/C	10	N/C
11	N/C	12	N/C
13	N/C	14	P15
15	P17	16	P16
17	N/C	18	P14
19	N/C	20	P12
21	P13	22	P10
23	P9	24	P8
25	P11	26	P7
27	P5	28	P6
29	FPVCC	30	FPVCC
31	N/C	32	N/C
33	P2	34	P4
35	P1	36	P3
37	P0	38	N/C
39	M	40	N/C
41	SHFCLK	42	ENABKL
43	FPVCC	44	FLM
45	FPVEE	46	LP
47	GROUND	48	GROUND
49	+12V	50	+12V

### 3.2 VGA Connector (CN2)

The JUKI-510 built-in 15-pin VGA connector that connect directly the CRT monitor.

- CN2: 15-pin VGA Connector

1	RED	2	GREEN
3	BLUE	4	NC
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	VCC	10	GROUND
11	NC	12	DDC DATA
13	HSYNC	14	VSYNC
15	DDC CLOCK		

### 3.3 External Switches and Indicators (CN3)

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN3 connector.

#### CN3:External Switches and Indicators

	PIN	DESCRIPTION	PIN	DESCRIPTION	
Power LED	1	+5V	2	Speaker	Speaker
	3	GND	4	N/C	
	5	GND	6	N/C	
	7	N/C	8	+5V	
HDD LED	9	+5V	10	Reset Switch	Reset button
	11	IDE LED	12	GND	



### 3.4 External Power Connector (CN4)

The JUKI-510 has an on-board external power connector CN4. You can connect power directly to the CPU board.

- CN4: External Power Connector

PIN NO.	DESCRIPTION
1	+12V
2	GROUND
3	GROUND
4	VCC5V

### 3.5 Audio Connector (CN5,CDIN1)

The audio function was organized by CX5530 I/O companions and NS AD1881A CODEC, which compliant with AC97. You can use CD-IN as the input port (e.g.: connected to the output of CD player), depending on the type of connector that you have.

- CDIN1: CD\_AUDIO INPUT Connector

PIN NO.	DESCRIPTION
1	CD_L
2	GND
3	GND
4	CD_R

- CN5: Audio Connector

This is the output port of your Sound System. Pin 1-2-3 can be connected to earphone and 5-6-7 can be connected to loudspeaker. Pin 9-10-11 can be used as input port if it is connected to the earphone jack of your CD. Pin 15-16 is for microphone.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPEAK_OUT_R	2	GND
3	SPEAK_OUT_L	4	GND
5	LINE_OUT_R	6	LINE_OUT_L
7	GND	8	GND
9	LINE_IN_L	10	LINE_IN_R
11	GND	12	GND
13	GND	14	GND
15	MIC IN	16	GND

### 3.6 ATX Power Connector (CN6,CN7)

The JUKI-510 can accept AT or ATX power supply . The CN6,CN7 provide the ATX power controlled signals and +5V standby voltage (+5VSB).

- CN6: ATX Power connector

PIN NO.	DESCRIPTION
1	+5VSB
2	PSON
3	GROUND

- CN7: ATX Power controlled signal connector

PIN NO.	DESCRIPTION
1	Power Button
2	GROUND

Application: The CN6 can connect to the backplane directly when the backplane supports the ATX function . And the CN7 connects to the power button in the chassis.

### 3.7 LAN RJ45 Connector (CN16)

The JUKI-510 built-in RJ45 LAN connector is for 10/100Mbps Ethernet (REALTEK 8139C). Support wake-on-LAN when you use the ATX power supply.

- CN16: LAN RJ45 Connector

1	TX+	5	GND
2	TX-	6	RX-
3	RX+	7	GND
4	GND	8	GND

### 3.8 USB Port Connector (CN17)

The JUKI-510 provides two USB interfaces, which give the completed plug and play, for up to 127 external devices.

- CN17: Internal USB Connector

1.	+5V	5.	GND
2.	D1F-	6.	D2F+
3.	D1F+	7.	D2F-
4.	GND	8.	+5V

### 3.9 CompactFlash Connector -- TYPE II (CN18)

You can attach one Compact Flash Disk to CN18 that occupy the Secondary IDE channel. The CN18 supports both the TYPE II and TYPE I module.

- CN18 : 50-pin CompactFlash Connector (secondary IDE)

PIN NO	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	N/C
12	N/C	37	INTERRUPT
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	N/C
19	SA1	44	VCC_COM
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	N/C
22	DATA 1	47	DATA 8
23	DATA 2	48	DAYA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK	50	GROUND

### 3.10 E-IDE Hard Disk Connector (CN19)

For IDE HDD connection, The JUKI-510 was designed with one 2.54mm connector (CN19), which could be converted to two 2.54mm standard IDE connector via proprietary cable.

- CN19 : 40-pin Primary IDE Interface 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	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND-DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

### 3.11 Serial Ports (CN20, CN21)

The JUKI-510 offers two high speeds NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports. These ports let you connect to serial devices or a communication network. One 9-pin D-SUB connector and one 14-pin header are provided by the JUKI-510. The detailed pin assignment of the connectors are specified as following tables:

- CN20(com1) serial Port Connector (9-pin DSUB)

PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

- CN21 (com2): Serial Port Connector (14-pin Header/W Housing)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	N/C
11	TX2+	12	TX2-
13	RX2+	14	RX2-

**Note:** If you want to use the RS485, just connect to TX2-, TX2+. If you want to use the RS422, please connect to TX2-, TX2+, RX2+, and RX2-.

### 3.12 Keyboard & PS/2 Mouse Connector (CN22,CN23)

The JUKI-510 provides one 6-pin mini-DIN connector for one keyboard and one PS/2 mouse connectors and one 5-pin external keyboard connector .

- CN22: 6-pin mini-DIN Keyboard & Mouse Connector

PIN NO.	DESCRIPTION
1	KB DATA
2	MS DATA
3	GND
4	+5V
5	KB CLOCK
6	MS CLOCK

- CN23: 5-pin External Keyboard Connector

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GND
5	+5V

### 3.13 IrDA Infrared Interface Port (CN24)

The JUKI-510 built-in an IrDA port which support Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. When use the IrDA port have to set SIR or ASKIR model in the BIOS's Peripheral Setup's COM2. Then the normal RS-232 COM2 will be disabled.

- CN24: IrDA connector

PIN NO.	DESCRIPTION
1	VCC
2	
3	IRRX
4	Ground
5	IR-TX
6	

### 3.14 Parallel Port (CN25)

This port is usually connected to a printer; The JUKI-510 includes an on-board parallel port (CN25), accessed through a 26-pin flat-cable connector.

- CN25: Parallel Port Connector

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



### 3.15 Floppy Disk Drive Connector (CN26)

JUKI-510 board is equipped with a 34-pin daisy-chain driver connector cable.

#### CN26: FDC 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 GATE#
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#

### 3.16 Digital I/O (CN27)

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the JUKI-510.

Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices. The register address is 240H, 260H or 280H, which is selected in BIOS SETUP. You can read or write data to the selected address to enable the function of digital IO.

- CN27: Digital I/O

READ		WRITE	
Bit0	DIN0	Bit0	DO0
Bit1	DIN1	Bit1	DO1
Bit2	DIN2	Bit2	DO2
Bit3	DIN3	Bit3	DO3

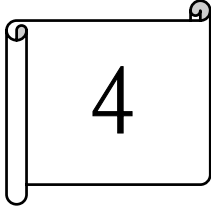
PIN #	Signal Name	PIN #	Signal Name
1	GND	2	+5V
3	DO3	4	DO2
5	DO1	6	DO0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

### 3.17 TV-OUT (CN28)

Provide composite and S-video & AV-video TV-OUT for NTSC or PAL.

- CN28: S-Video and AV-Video

<b>PIN #</b>	<b>Signal Name</b>	<b>PIN #</b>	<b>Signal Name</b>
1	GROUND	2	LUMF
3	GROUND	4	CHROMF
5	GROUND	6	COMPOSITE



# AWARD BIOS Setup

JUKI-510 uses the AWARD PCI/ISA BIOS for system configuration. The AWARD BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options that may be selected to meet end-user requirements. This chapter is written to assist you in the proper usage of these features.

## 4.1 Getting Start

**When you turn on the power button, the BIOS will enter the Power-On-Self-Test routines. These routines will be executed for system test and initialization and system configuration verification. After the POST routines are completed, the following message appears:**

**" Hit DEL if you want to run SETUP"**

To access AWARD BIOS SETUP UTILITY, press <Del> key. The following screen will be displayed at this time:

ROM PCI/ISA BIOS (2A434I9C)  
CMOS SETUP UTILITY  
AWARD SOFTWARE, INC.

---

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	

---

Esc : Quit                                 ↑ ↓ → ← : Select Item  
F10 : Save & Exit Setup               (Shift)F2 : Change Color

---

## 4.2 Standard CMOS Setup

The Standard CMOS Setup is used for basic hardware system configuration. The main function is for Date/Time setting and Floppy/Hard Disk Drive setting. Please refer the following screen for this setup.

---

ROM PCI/ISA BIOS (2A434I9C)  
STANDARD CMOS SETUP  
AWARD SOFTWARE, INC.

---

Date (mm:dd:yy) : Fri, Mar 9 2001  
Time (hh:mm:ss) : 9 : 23 : 34

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	: AUTO	0	0	0	0	0	0	AUTO
Primary Slave	: AUTO	0	0	0	0	0	0	AUTO
Secondary Master	: AUTO	0	0	0	0	0	0	AUTO
Secondary Slave	: AUTO	0	0	0	0	0	0	AUTO

Drive A : 1.44M , 3.5 in  
Drive B : None

Video : EGA/VGA  
Halt On : All Errors

---

ESC : Quit                                 ↑ ↓ → ← : Select Item               PU/PD/+/- : Modify  
F1 : Help                               (Shift)F2 : Change Color

---

**To set the Date**, for example, press either the arrow or <Enter> button on your keyboard to select one of the fields (Month, Date or Year) then press either <PgUp> or <PgDn> to increase or decrease the value of that field. Do the same steps for Time setting.

**For IDE hard disk drive setup**, please check the following possible setup procedure:

1. Use the Auto setting for detection during boot-up.
2. Use the IDE HDD AUTO DETECTION in the main menu; the computer will automatically detect the HDD specifications.
3. Manually enter the specifications by yourself from the "User" option.

*Note:*

*If you need more information on any particular field, just highlight it then press <F1> button. A pop-up window will come out to give you more information on that field.*

### **4.3 BIOS Features Setup**

**This BIOS Features Setup is designed for the 'fine tuning' of your system in order to improve its performance. As for normal operation, you don't have to change any default setting. The default setting is pre-set for most reliable operation.**

ROM PCI/ISA BIOS (2A434I9C)  
BIOS FEATURES SETUP

ROM PCI/ISA BIOS (2A434I9C)  
CHIPSET FEATURES SETUP  
AWARD SOFTWARE, INC.

---

SDRAM CAS latency Time : 3 T	
SDRAM Clock Ratio Div By : 4	
16-bit I/O Recovery (CLK): 5	
8-bit I/O Recovery (CLK): 5	
USB Controller : Disabled	
Multiple Monitor Support : No Onboard	
Video Memory Size : 2.5 M	
TV Output Mode : NTSC	
Flat Panel Status : Enabled	
Flat Panel Resolution : 800x600	
	ESC : Quit           ↑↓←→ : Select Item
	F1 : Help            PU/PD/+/- : Modify
	F5 : Old Values    (Shift)F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

---

## 4.4

This setup function works mostly on board's chipset. This option is used to change the chipset's configuration. Please, carefully change any default setting, otherwise the system will run unstable.

ROM PCI/ISA BIOS (2A434I9C)  
CHIPSET FEATURES SETUP  
AWARD SOFTWARE, INC.

---

SDRAM CAS latency Time : 3 T	
SDRAM Clock Ratio Div By : 4	
16-bit I/O Recovery (CLK): 5	
8-bit I/O Recovery (CLK): 5	
USB Controller : Disabled	
Multiple Monitor Support : No Onboard	
Video Memory Size : 2.5 M	
TV Output Mode : NTSC	
Flat Panel Status : Enabled	
Flat Panel Resolution : 800x600	
	ESC : Quit           ↑↓→← : Select Item
	F1 : Help            PU/PD/+/- : Modify
	F5 : Old Values    (Shift)F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

---

## 4.5 Power Management Setup

Power Management Setup helps user to handle the JUKI-510 board's "green" function. This feature can shut down the video display and hard disk to save energy, for example. The power management setup screen is as following



ROM PCI/ISA BIOS (2A434I9C)  
POWER MANAGEMENT SETUP  
AWARD SOFTWARE, INC.

Power Management	: Disabled	IRQ1 (KeyBoard)	: ON
** PM Timers **		IRQ3 (COM 2)	: OFF
Doze Mode	: Disabled	IRQ4 (COM 1)	: OFF
Standby Mode	: Disabled	IRQ5 (LPT 2)	: OFF
HDD Power Down	: Disabled	IRQ6 (Floppy Disk)	: OFF
MODEM Use IRQ	: NA	IRQ7 (LPT 1)	: OFF
Throttle Duty Cycle	: 33.3 %	IRQ9 (IRQ2 Redir)	: OFF
		IRQ10 (Reserved)	: OFF
		IRQ11 (Reserved)	: OFF
		IRQ12 (PS/2 Mouse)	: OFF
		IRQ13 (Coprocessor)	: OFF
		IRQ14 (Hard Disk)	: OFF
		IRQ15 (Reserved)	: OFF
		ESC : Quit	↑↓←→ : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

## 4.6 PNP / PCI CONFIGURATION

This menu is used to assign certain IRQ to your PNP/PCI devices manually.

ROM PCI/ISA BIOS (2A434I9C)  
PNP/PCI CONFIGURATION  
AWARD SOFTWARE, INC.

PNP OS Installed	: No	PCI IRQ Activated By	: Edge
Resources Controlled By	: Manual	Used MEM base addr	: N/A
Reset Configuration Data	: Disabled		
IRQ-3 assigned to	: PCI/ISA PnP		
IRQ-4 assigned to	: PCI/ISA PnP		
IRQ-5 assigned to	: PCI/ISA PnP		
IRQ-7 assigned to	: PCI/ISA PnP		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: PCI/ISA PnP		
IRQ-15 assigned to	: Legacy ISA		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP		
DMA-3 assigned to	: PCI/ISA PnP		
DMA-5 assigned to	: PCI/ISA PnP		
DMA-6 assigned to	: PCI/ISA PnP		
DMA-7 assigned to	: PCI/ISA PnP		
		ESC : Quit	↑↓←→ : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

**PNP OS Installed:** if you install Plug and Play operating system (OS), the OS will reassign the interrupt if you select Yes in this field. If you install a non-Plug and Play OS or if

you want to prevent reassigning of interrupt settings, select *No* in this field.

**Resources Controlled By:** select *Auto* if you want the computer to assign the IRQs automatically and vice versa.

**Reset Configuration Data:** *Enabling* this field means you allow the configuration data to be reset.

**IRQ-xx assigned to:** these fields show whether a PCI/ISA uses certain IRQ.

## 4.7 LOAD BIOS DEFAULTS

```
ROM PCI/ISA BIOS (2A434I9C)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

-----
STANDARD CMOS SETUP          INTEGRATED PERIPHERALS
BIOS FEATURES SETUP         SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP      USER PASSWORD
POWER MANAGEMENT SETUP      IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION       SETUP
LOAD BIOS DEFAULT           Load BIOS Defaults (Y/N)? N
LOAD SETUP DEFAULTS        SAVING
-----
Esc : Quit                  ↑ ↓ → ← : Select Item
F10 : Save & Exit Setup    (Shift)F2 : Change Color
-----
```

If you select 'Y' to this field, the BIOS Defaults will be loaded except Standard CMOS SETUP. The default settings are not optimal and turning all high performance into disabled condition. Select 'N' to abort.

*Suggestion: for the first time or for our primary user, we suggest you to use LOAD SETUP DEFAULTS because it is the safest mode for your system.*

## 4.8 LOAD SETUP DEFAULTS

```
ROM PCI/ISA BIOS (2A434I9C)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.
```

---

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	ETUP
LOAD BIOS DEFAULT	LOAD SETUP Defaults (Y/N)? N
LOAD SETUP DEFAULTS	SAVING

---

```
Esc : Quit
F10 : Save & Exit Setup

↑ ↓ → ← : Select Item
(Shift)F2 : Change Color
```

---

If you select 'Y' to this field, the Setup Defaults will be loaded except Standard CMOS SETUP. The default settings are optimal configuration settings for your system.

## 4.9 INTEGRATED PERIPHERALS

ROM PCI/ISA BIOS (2A434I9C)  
INTEGRATED PERIPHERALS  
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	IR Transmission delay	: Enabled
Primary IDE Channel	: Enabled	Onboard Parallel Port	: 378/IRQ7
Master Drive PIO Mode	: Auto	Parallel Port Mode	: SPP
Slave Drive PIO Mode	: Auto	ECP Mode Use DMA	: 3
Secondary IDE Channel	: Enabled	EPP Mode Select	: EPP1.7
Master Drive PIO Mode	: Auto	Digital I/O	: 280h
Slave Drive PIO Mode	: Auto		
IDE Primary Master UDMA	: Auto	Build in CPU Audio	: Enabled
IDE Primary Slave UDMA	: Auto	Audio I/O Base Address	: 220H
IDE Secondary Master UDMA	: Auto	MPU-401 I/O Base Address	: 330H
IDE Secondary Slave UDMA	: Auto	Audio IRQ Select	: IRQ 5
		Audio Low DMA Select	: DMA 1
		Audio High DMA Select	: DMA 5
KBC input clock	: 8 MHz		
Onboard FDC Controller	: Enabled		
Onboard Serial Port 1	: 3F8/IRQ4		
Onboard Serial Port 2	: 2F8/IRQ3		
UART Mode Select	: Normal		
UART2 Duplex Mode	: Half		
RxD , TxD Active	: Hi,Lo		

This option is used to assign Onboard I/O, IRQ, and DMA etc. If you don't know how to configure them, just press <F7> to load Setup Defaults.

The flat panels will then be applied with two modes: 640x480 or 800x600, for which it needs to set up from BIOS for proper flat panel resolution.

- **Digital I/O Base Address -- 240H, 260H, 280H, Disabled**  
To select the I/O address for digital I/O function.
- **Build in CPU Audio -- Enabled, Disabled**  
To disable/enable the audio function.
- **Audio I/O Base Address -- 220H, 240H, 260H, 280H**  
To select the I/O address for audio function.
- **MPU-401 I/O Base Address -- 300H, 330H, Disabled**  
To select the I/O address for MPU-401 (midi interface).
- **Audio IRQ Select -- 5, 7, 10, Disabled**  
To select the interrupt for audio function.
- **Audio Low DMA Select -- DMA0, DMA1, DMA3, Disabled**  
To select the high DMA channel.
- **Audio High DMA Select -- DMA5, DMA6, DMA7, Disabled**  
To select the high DMA channel.

- **Multiple Monitor Support -- No Onboard, PCI first, M/B first**  
To select the primary VGA for multiple monitor support in WINDOWS.
- **Video Memory Size -- 1.5M, 2.5M, 4.0M**  
To select the size of video memory. It makes use of system memory for display.
- **TV-OUT Mode – NTSC, PAL**  
To select the TV-OUT mode.

## 4.10 PASSWORD SETTING

Password SETTING sets a password that is used to protect your system and Setup Utility. Once you setup the password, the system will always ask you to key-in password every time you enter the BIOS SETUP. If you enter the BIOS SETUP with Password, you can choose every setup/option on the main menu. To disable the password, enter the BIOS SETUP room with Password and then just press the <Enter> key instead of entering a new password when the 'Enter Password' prompt pop-up.

*N.B.: if you forget the password, do the Clear/Reset CMOS procedure (see Section 2.5 Clear CMOS Setup)*

## 4.11 IDE HDD AUTODETECTION

This option detects the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc) automatically and will put the parameters into the Standard CMOS Setup screen. Up to 2 IDE drives can be detected and the parameters will be

listed in the box. Press <Y> if you accept these parameters.  
Press <N> to skip the next IDE drives.

**Note: If your IDE HDD was formatted in previous older system, incorrect parameters may be detected. In this case, you need to enter the correct parameters manually or low-level format the disk**

## 4.12 SAVE AND EXIT SETUP

```
ROM PCI/ISA BIOS (2A434I9C)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

-----
STANDARD CMOS SETUP          INTEGRATED PERIPHERALS
BIOS FEATURES SETUP         SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP      USER PASSWORD
POWER MANAGEMENT SETUP     IDE HDD AUTO DETECTION
ENR/PCI CONFIGURA         ETUP
LOAD BIOS DEFAULT          SAVING
LOAD SETUP DEFAULTS

SAVE to CMOS and EXIT (Y/N)? N

-----
Esc : Quit
F10 : Save & Exit Setup

↑ ↓ → ← : Select Item
(Shift)F2 : Change Color

-----
```

Select this option when you finish setting all the parameters and want to save them into the CMOS. Just simply press <Enter> key and all the configuration changes will be saved

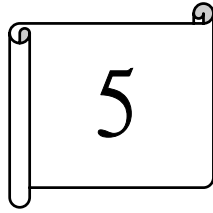
## 4.13 Quit Without Saving

```
ROM PCI/ISA BIOS (2A434I9C)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

-----
STANDARD CMOS SETUP             INTEGRATED PERIPHERALS
BIOS FEATURES SETUP            SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP         USER PASSWORD
POWER MANAGEMENT SETUP        IDE HDD AUTO DETECTION
PNP/PCI CONFIGURA              ETUP
LOAD BIOS DEFAULT              SAVING
LOAD SETUP DEFAULTS

-----
Esc : Quit                      ↑ ↓ → ← : Select Item
F10 : Save & Exit Setup         (Shift)F2 : Change Color
-----
```

Select this option if you want to exit the Setup without saving the changes that you made. Just simply press <Enter> key and you will exit the BIOS SETUP without saving the changes.



## **SVGA Setup**

### **5.1 Introduction**

The JUKI-510 is equipped with on-board LCD/VGA interface. The description below is its specifications and features:

#### **5.1.1 Chipset**

The JUKI-510 uses a Cyrix CX5530A chipset as its SVGA controller. It is compatible with many common 18-bit LCD displays and traditional analog CRT monitors. The VGA BIOS supports LCD. Besides, it also accepts interlaced and non-interlaced analog monitors (color and monochrome VGA) with high-resolution quality while maintaining complete IBM VGA compatibility. But digital monitors (i.e. MDA, CGA, and EGA) can be NOT supported. Multiple frequency (multisync) monitors are operated as if they were analog monitors.

#### **5.1.2 Display memory**

Having 1.5 ~ 4 MB UMA memory, the VGA controller can make CRT displays or color panel displays perform with resolutions up to 1024 x 768 at 64 K colors. The display memory can be modified up to 4 MB in BIOS for true-color resolution of 1024 x 768.



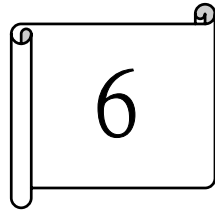
### **5.1.3 Display drivers**

1. Win95, 98 drivers (VGA & Audio) in  
    \VGA\MediaGX\National Geode Win9x Drivers 1.2
  
2. WinNT4.0, Windows 2000 driver in  
    \VGA\MediaGX\Nt40Vga\

## **5.2 Further Information**

For more detailed information about the PCI/SVGA installation in your JUKI-510, including driver updates, troubleshooting instructions, please refer to the following webs, which provide some resources you may need. If not find the information you need, please contact with your local contributor or ICP support team:

ICP web site: [www.iei.com.tw](http://www.iei.com.tw)



## Audio

### 6.1 Introduction

With on-board audio interface, the JUKI-510 can perform high-quality stereo sound and FM music synthesis (ESFM) by using the CX5530A audio controller. The audio interface has functions of recording, compressing, and playing back voice, sound, and music with a built-in mixer control. In addition, the on board audio interface supports the Plug and Play (PnP) standard and provides PnP configuration for audio, FM, and MPU-104 logical devices. It is compatible with AC97 version 2.0, voice, and music functions. The ESFM synthesizer is register compatible with the OPL3 and has extended capabilities.

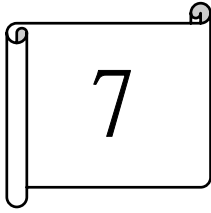
#### 6.1.1 Audio drivers

##### 1. Installing software driver in Windows NT

The driver was provided from the CD utility.  
WinNT4.0 Audio drivers in  
\\Audio\\MediaGX

##### 2. Installing software driver in Win95/98

The software drivers was supported from Windows 95/98,  
please set up from...  
\\VGA\\MediaGX\\National Win9x Drivers 1.2



## **PCI Bus Ethernet Interface**

### **7.1 Introduction**

The JUKI-510 provides a high performance 32-bit Ethernet chipset, which is completely compliant with IEEE 802.3 100 Mbps CSMA/CD standards. It is both 100Base-T and 10Base-T compatible. The major network operating system fits it.

The Ethernet port supplies a standard RJ-45 connector on board. To utilize the network boot feature is by incorporating the boot ROM image files for the appropriate network operating system.

## Appendix A. Watchdog Timer

The Watchdog Timer is a device to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working normally, hardware on the board will perform hardware reset (cold boot) to bring the system back to a known state.

Three I/O ports control the Watchdog Timer.

443	Write	Set Watchdog Time period
443 (hex)	Read	Enable the refresh the Watch-Dog Timer.
043/843 (hex)	Read	Disable the Watchdog Timer.

Prior to enable the Watchdog Timer, user has to define Timer first. The output data is a value of time interval and the range of the value is from 01(hex) to FF (hex) and time interval 1 sec to 255 sec.

Data	Time Interval
01	1 sec
02	2 sec
03	3 sec
04	4 sec
.	.
.	.
.	.
FF	255 sec

This will enable and activate the countdown timer which will eventually time out and reset the CPU to ensure that this reset condition does not occur, the Watchdog Timer must be

periodically refreshed by reading the same I/O port 043/843H and 443H. This must be done within the time out period that is selected by software, please refer to the example program.

A tolerance of at least 5% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time consuming. Therefore if the time out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: when exiting a program it is necessary to disable the Watchdog Timer, otherwise the system will reset.

Example assembly program:

```
TIMER_PORT    = 443H
```

```
TIMER_START   = 443H
```

```
TIMER_STOP    = 843H
```

```
;;INITIAL TIME PERIOD COUNTER
```

```
MOV DX, TIME_PORT
```

```
MOV AL, 8:    ;;8 SECONDS
```

```
OUT DX,AL
```

```
;;ADD YOUR APPLICATION HERE
```

```
MOV DX, TIMER_START
```

```
IN AL, DX.   ;;START COUNTER
```

```
:::ADD YOUR APPLICATION HERE  
W_LOOP:  
MOV DX, TIMER_STOP  
IN AL, DX  
MOV DX, TIMER_START  
IN AL, DX.      ;;RESTART COUNTER
```

```
:::ADD YOUR APPLICATION HERE  
CMP EXIT_AP, 0  
JNE W_LOOP  
MOV DX, TIMER_STOP  
IN AL, DX  
;;EXIT AP
```

# Appendix B. I/O Address Map

## B.1 System I/O Address Map

I/O Address Map	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
022-023	Chipset address
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0FF	Math Coprocessor
170-1FF	VIR BUS Master PCI IDE Controller
220-22F	Audio 16bit sound
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
378-37F	Parallel Printer Port 1
3B0-3DF	Cyrix Graphic Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Floppy Disk Controller
3F8-3FF	Serial Port 1
443	Watch dog timer enable
043/843	Watch dog timer disable

PNP audio I/O map range from 220~250H (16 bytes)

MPU-401 select from 300~330H (2 bytes)

## B.2 DMA channel assignments

Channel	Function
0	Available
1	Audio*
2	Floppy disk (8-bit transfer)
3	Parallel**
4	Cascade for DMA controller 1
5	Audio*
6	Available
7	Available

- \* Audio DMA defaults setting: DMA 1.5  
 Audio High DMA select: DMA 1.3  
 Audio Low DMA select: DMA 5.6.7
- \*\* parallel port DMA default setting: DMA 3  
 parallel port DMA select: DMA 1.3

### B.3 Interrupt assignments

Interrupt #	Interrupt source
NMI	Parity error detected
IRQ 0	System timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 9	LAN 82559
IRQ 10	Serial communication port 4
IRQ 11	Serial communication port 3
IRQ 12	PS/2 mouse
IRQ 13	Numeric data processor
IRQ 14	CX5530 Primary IDE controller
IRQ 15	CX5530 Second IDE controller
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Audio*
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)

\* Audio default setting: IRQ5

Ethernet IRQ is automatic set by the system



## B.4 1<sup>st</sup> MB memory map

Address	Description
F000h-FFFFh	System ROM
D800h-EFFFh	Unused
C800h-D7FFh	Ethernet ROM*
C000h-C7FFh	Expansion ROM*
B800h-BFFFh	CGA/EGA/VGA text
B000h-B7FFh	Unused
A000h-AFFFh	EGA/VGA graphics
0000h-9FFFh	Base memory
D000-D400H	Available

\* Default setting

\*\* If Ethernet boot ROM is enabled.