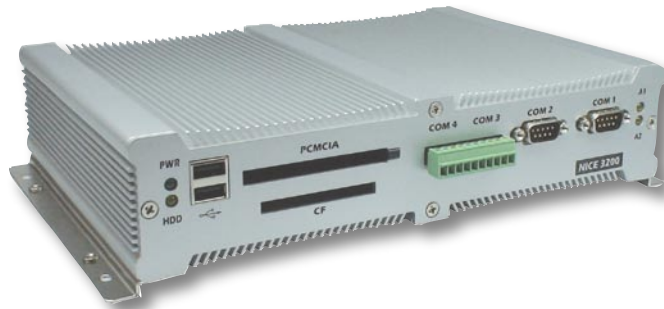




Building the Digital Infrastructure

NEXCOM



NICE 3200, NICE 3220, ICES 101, ICES 120, ICEB 3200

User Manual

Version 1.01

June 15, 2006

Thank you for purchasing Nexcom's application ready ETX modular solutions that are comprised of a choice of two ETX embedded computing modules, two chassis configurations that include custom carrier board, as well as chassis expansion capability when more room is needed.

Nexcom's high performance, robust and fanless NICE 3200 has an ICES 101 ETX module with an Intel® Celeron® M low power processor and Intel® 852GM chipset. The NICE 3220 has an ETX module with an AMD Geode™ LX800 processor and AMD Geode™ CS5536 chipset. Encased in a self contained and extremely robust cast aluminum chassis, the NICE Series offer flexible I/O expansion (customization support available), few moving parts and a smart design that makes mounting, maintenance and upgrades faster and more efficient. The chassis protects all components well and is extremely vibration resistant.

The four ETX connectors on the ETX module provides various signals to your carrier board that can be designed for different applications. Support includes ISA, PCI, IDE, LPT, VGA, LVDS, serial, USB interfaces and others. ICES 101 provides cost effective versatile functionality and high performance using Intel processors, and is an ideal ETX module for high-end embedded applications. ICES 120 provides cost effective, versatile functionality and is an ideal ETX module for embedded applications.

With integrated graphics and audio support, plus a generous amount of I/O flexibility, these low-power NICE Series target industrial automation applications such as logistics, field controllers, data acquisition, equipment PC, access control and other industrial automation applications such as embedded system applications for machine automation, and industrial plant and cabinet integration.

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Declaration of Conformity CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. Please contact your local supplier for ordering information.

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Installation Suggestions

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

A Philips screwdriver

A flat-tipped screwdriver

A grounding strap

An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Handling Precautions

1. Always disconnect the unit from the power outlet whenever you are installing or fixing a component inside the chassis.
2. If possible, always wear a grounded wrist strap when you are installing or fixing a component inside the chassis. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
3. Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
4. Use the correct screws and do not overly tighten them.
5. Keep the original packaging and static-protective bag in case the unit has to be returned.

NEXCOM RMA Policy

1. Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 24 months beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

2. RMA (Return Merchandise Authorization)

2.1 Customers shall enclose the “NEXCOM RMA Service Form” with the returned packages.

2.2 Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the “NEXCOM RMA Service Form” for the RMA number apply process.

2.3 Customers can send back the faulty products with or, without accessories (manuals, cable, etc.) and any unnecessary components from the card, such as CPU and DRAM. If the components were suspected as part of the problems, please note clearly that which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.

2.4 Customers are responsible to for the safe packaging of defective products are durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during the transportation, the repair is treated as “Out of Warranty.”

2.5 Any products returned by NEXCOM to other locations besides the customers’ site will bear an extra charge and will be billed to the customer.

3. Repair service charges for out of warranty products

NEXCOM will charge for out of warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

3.1 System level

- a. Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- b. Items will be replaced with NEXCOM products if the original one is not able to be repaired. Ex: motherboard, power supply, etc.
- c. Replaced with 3rd party products if needed.
- d. If RMA goods can not be repaired, NEXCOM will return it to customer without any charge.

3.2 Board level

- a. Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- b. If RMA goods can not be repaired, NEXCOM will return it to customer without any charge.

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RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

Nexcom is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/EU, to be your trusted green partner and to protect our environment.



RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How do you recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name. For example, PEAK 7220VL2G RoHS version will become PEAK 7220VL2G(LF).

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention. For example, PEAK 870VL2, NBP14570, EBC 420 etc.

All RoHS compliant model and component manufacturing part numbers will be suffixed "XO". For Example:

73AI064M03X0 CF CARD INDUSTRY, 64MB, T: 0-70°C, PQI:AC47-0640-0442, PBFREE

71A5500301X0 CPU+NB, AMD LX800, 500MHz/128K ,BGU481, AMD:ALXC800EETJ2VD

1E00042001X0 EBC420-LX8

Manual Revision History

Revision	Date	Description
1.0	July 25, 2006	Initial Draft

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Chapter 1 Product Introductions and Descriptions

NEXCOM

NICE 3200, NICE 3220, ICES 101, ICES 120, ICEB 3200

1.1 ETX Computing Modules: ICES 101, ICES 120

ICES 101

ICES 101 is an ETX module with an Intel® Celeron® M or Pentium® M low power processor and Intel® 852GM chipset. The four ETX connectors on the module provide various signals to your carrier board that can be designed for different applications. Support includes ISA, PCI, IDE, LPT, VGA, LVDS, Serial, USB interfaces and others.



ICES-101

is an ideal ETX module for high-end embedded applications.

ICES 120:

ICES 120 is an ETX module with an AMD Geode™ LX800 processor and AMD Geode™ CS5536 chipset supporting one DDR SODIMM socket for up to 1 GB Non-ECC Non-Registered DDR SDRAM. The four ETX connectors on the module provide various signals to your carrier board that can be designed for different applications. Support includes ISA, PCI, IDE, LPT, VGA, LVDS, serial, USB interfaces and others. The on-board VIA VT6105 10/100 Ethernet controller and VT1616 CODEC provide one LAN port and an AC'97 audio interface through the ETX connectors for your external communications. ICES 120 provides cost effective, versatile functionality and is an ideal ETX module for embedded applications.



ICES-120

1.2 ICEB 3200 ETX Carrier Board

The ICEB 3200 ETX carrier board supports peripheral and network connections for the ICES 101,120 CPU modules. Via four connectors, PCI bus, ISA bus and I/O signals such as serial ports, parallel port, USB ports, video and LCD signals, Ethernet, keyboard, mouse and audio interface are brought to the ICEB 3200 carrier board, providing a scalable solution that offers a custom-fit solution for both the NICE 3200 and NICE 3220 chassis.



ICEB-3200 Carrier Board

1.3 NICE 3200 Fanless System

NICE 3200

The NICE 3200 fanless system with aluminum chassis targets industrial automation applications such as logistics, field controllers, data acquisition, equipment PC, access control and others. There are some special requirements under these definitions, for example, more serial ports for legacy device connection that includes two RS422/RS485 interfaces with Automatic Flow Control, ± 15 KV ESD protected and Isolation (Optical Isolation, Min 2 KV) though a 10-pin screw terminal connector. Furthermore, an optional NVRAM socket is reserved for memory backup SRAM, which offers optional dedicated plug-in NVRAM memory.



NICE-3200 Series

Apart from the designed-in features such as both an internal and external CompactFlash socket, VGA, USB Port, LPT, KB, mouse, Ethernet and audio interface, there are extra user-friendly features such as Type I/II PC Card (PCMCIA) support which provides PC card add-on module to enhance the overall solution and two LEDs that connect to GPIO that are programmable for alarms or other purposes defined by a developer. An on-board power control circuit accepts a wide range single input DC power supply voltages from +9 V to +36 V that allow the NICE 3200 to meet most application requirements.

NICE 3220

The NICE 3220 fanless system with aluminum chassis targets a range of industrial automation applications such as logistics, field controllers, data acquisition, equipment PC, access control and others. Serial ports for legacy device connection includes two RS422/RS485 interfaces with Automatic Flow Control, ± 15 KV ESD protected and Isolation (Optical Isolation, Min 2 KV) though a 10-pin screw terminal connector. Furthermore, an optional NVRAM socket is reserved for memory backup SRAM, which offers optional dedicated plug-in NVRAM memory.

Apart from the useful designed-in features such as internal CompactFlash socket, VGA, USB Port, LPT, KB, mouse, Ethernet and audio interface, there are extra features such as Type I/II PC Card



NICE-3220 Series

(PCMCIA) which provides a PC card add-on that is great for wireless expansion and two LEDs that connect to GPIO that are programmable for alarms or other purposes defined by a developer. An on-board power control circuit accepts a wide range of single input DC power supply voltages from +9 V to +36 V allowing the NICE 3220 Series to meet most application requirements in the industrial field.

1.4 Expansion Capability

Both the NICE 3200 and 3220 system designs offer expansion kits which are available by request and an ODM basis. Typical utilization of 2nd floor space on top of the original base enclosure could include PC/104 or PC/104-Plus modules that offer customer-defined I/Os or a slim-type CD-ROM. The maximum height of the expansion level combined with base enclosure is around 90 mm.

Nexcom offers two kinds of expansion kits for the NICE 3200 and 3220 Series. Please see Appendix A to see how easy expansion is.

Option A: Expansion DIY Kit

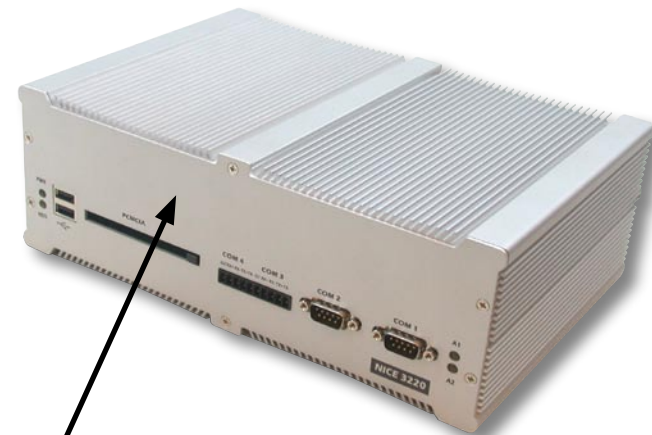
Option A expansion DIY kit simply extends the current chassis. It is a fast, less expensive way to gain the additional expansion capability your solution needs. Front and back faceplates plus side extensions are easy to add.



NICE 3220 Expansion DIY Kit - Back

Option B: Expansion Upgrade Kit

Option B expansion is a complete upgrade kit where the front and rear panels are one piece and can be fully customized to exactly match your I/O configuration. It is a solid solution with about a month leadtime for customized solutions. This expansion offers solid chassis expansion, saves installation time and gives a tailor-made look and feel to a customer's application ready solution.



Expansion Upgrade Kit - Front

Option B: Expansion Upgrade Kit
Solid one-piece faceplate and backplate
can be customized to customer specs

Option A: Expansion DIY Kit
Add on extension front and rear makes
for a quick and effective expansion
solution

1.5 Ordering Information

NICE Series Ordering Information

w/ 600MHZ CPU w/ 256MB Memory NICE 3200-C65 (P/N:1J00320001X0)	Celeron M 600MHZ w/512KB L2 FANless Controller w/ 256MB Memory (ICES 101-C65) Two RS232 and Two RS422/485 (Automatic Flow Control and Isolation) NVRAM Socket be reserved for Optional Memory Backup SRAM Type I/II PC Card (PCMCIA) CompactFlash Socket, VGA, USB Port, LPT, KB, Mouse, Ethernet and Audio Single Input DC power supply voltage from +9V to +36V
w/ 1GHZ CPU w/ 512MB Memory NICE 3200-373 (P/N:1J00320002X0)	Celeron M 1GHZ w/512KB L2 FANless Controller w/ 512MB Memory (ICES 101-373) Two RS232 and Two RS422/485 (Automatic Flow Control and Isolation) NVRAM Socket be reserved for Optional Memory Backup SRAM Type I/II PC Card (PCMCIA) CompactFlash Socket, VGA, USB Port, LPT, KB, Mouse, Ethernet and Audio Single Input DC power supply voltage from +9V to +36V
w/AMD Geode LX800 w/ 256MB Memory NICE 3220-LX8 (P/N:1J00322001X0)	AMD Geode LX800 Base FANless Controller w/ 256MB Memory (ICES120) Two RS232 and Two RS422/485 (Automatic Flow Control and Isolation) NVRAM Socket be reserved for Optional Memory Backup SRAM Type I/II PC Card (PCMCIA) CompactFlash Socket, VGA, USB Port, LPT, KB, Mouse, Ethernet and Audio Single Input DC power supply voltage from +9V to +36V

ICES Series Ordering Information

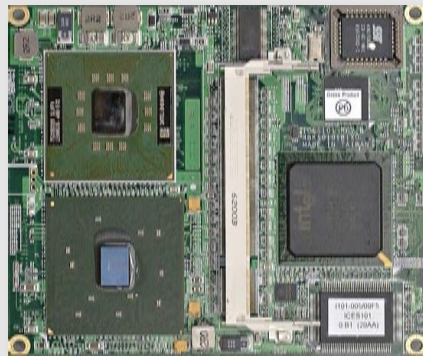
AMD LX800 Base ICES 120 (P/N: 1K00012000X0)	ETX Module AMD Geode LX800 and CS5536 with 128 KB L2 cache, VGA/ISA/PCI/IDE/LVDS/Audio/COM/LPT/USB 2.0/LAN Interface
Celeron M Base ICES 101-C65 (P/N: 1K00010102X0)	ETX Module with onboard Intel® Celeron® M 600 MHz 512KB L2 Cache processor, VGA/ISA/PCI/IDE/LVDS/Audio/COM/LPT/USB2.0/LAN Interface
Celeron M Base ICES 101-373 (P/N: 1K00010101X0)	ETX Module with onboard Intel® Celeron® M 1GHz 512KB L2 Cache processor, VGA/ISA/PCI/IDE/LVDS/Audio/COM/LPT/USB2.0/LAN Interface
Celeron M/ Pentium M Base ICES 101-SKT (P/N: 1K00010103X0)	ETX Module supporting socket Intel® Celeron® M / Pentium® M processor,VGA/ISA/PCI/IDE/LVDS/ Audio/COM/LPT/USB2.0/LAN Interface

ICEB Series Ordering Information

ICEB 3200-101-C65 (P/N: 1KB0320000X0)	ICES 101-C65 + ICEB 3200 , Intel Celeron M 600MHZ)
ICEB 3200-101-373 (P/N: 1KB0320001X0)	ICES 101-373 + ICEB 3200 , Intel Celeron M 1GHZ
ICEB 3200-120-LX8 (P/N: 1KB0320002X0)	ICES 120+ ICEB 3200 , AMD Geode LX800

Chapter 2 ICES 101 ETX Module Reference

NECOM



2.1 ICES 101 Function Block Diagram

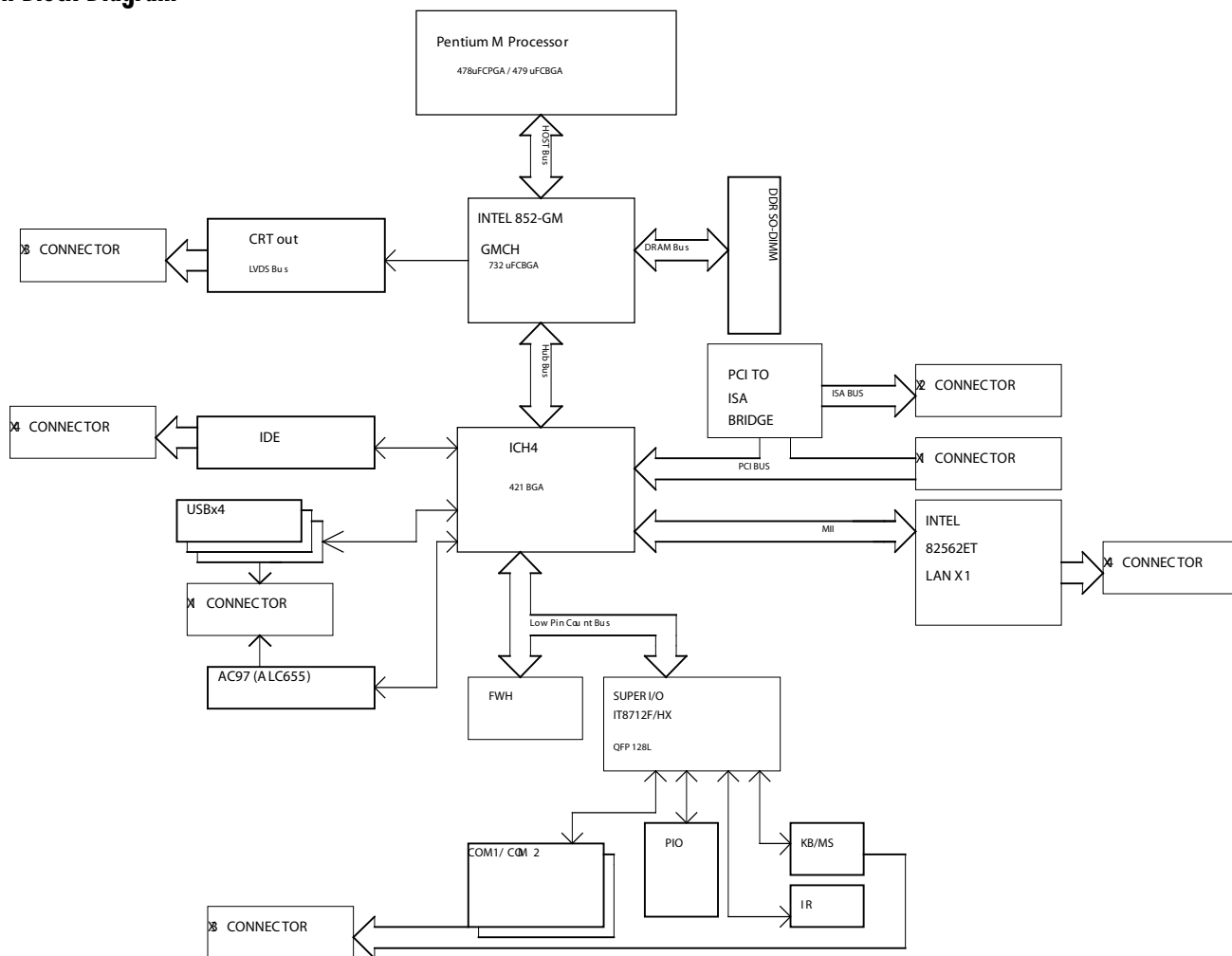


Figure 2.1: ICES 101 Function Block Diagram

2.2 Electrical Specifications

CPU: Intel® ULV Celeron® M 600 MHz (for Model ICES101-C65)
Intel® ULV Celeron® M 1 GHz (for Model ICES101-373)

NOTE: The Intel® 852GM integrated graphics solution up to 64 MB of dynamic video memory allocation can drive a standard progressive scan analog monitor with pixel resolution up to 1600 x 1200 at 85 Hz

Chipset: Intel® 852GM + ICH4 chipset
System Memory: Supports one unbuffered nonECC DDR SO-DIMM 200/266 memory up to 1GB
Graphics: Intel® 852GM integrated Graphic, supports both standard VGA and TFT.
CRT: Supports up to 1600 x 1200 at 85 Hz; 2048x1536 at 75 Hz
 DB15 CRT VGA connector x 1
LVDS: Supports up to 48-bit, 1600 x 1200 at 60 Hz
 Support single/dual pixel LVDS panel
 Onboard LVDS transmitter for LVDS Interface down to I/O Board.
Ethernet: Intel 82562ET 10/100 Fast Ethernet
 Supports PXE LAN boot function
Audio: ALC655 CODEC - AC97 Audio Interface
Super I/O: IT8712F

ETX Connectors

X1 32-bit/33Mhz PCI x 4
 Audio CODEC - AC97 Audio Interface
 USB 2.0 x 4
X2 ISA Interface

X3 VGA x 1
 LVDS x 1 (Dual Pixels)
 LPT x 1
 KB/Mouse
 COM1 and COM2
 IrDA 1.0 SIR

X4 Ethernet (10/100)
 SMBus
 IDE x 2

RTC: On-chip RTC with battery back up / External Li-ion Battery x 1 Located on Carrier Board
 RTC Tolerance less than 2 secs (24 hours) under 25°C environment

WatchDog: Watchdog timeout programmable by Software from 1 second to 256 seconds. (Tolerance 5% under room temperature 25°C)

BIOS: Award System BIOS
 Advanced Power Management support
 4Mbit flash ROM

Power Supply: Supports both AT and ATX Power Supply.
 +5V Power Only, follows ETX power and ground pin definitions.

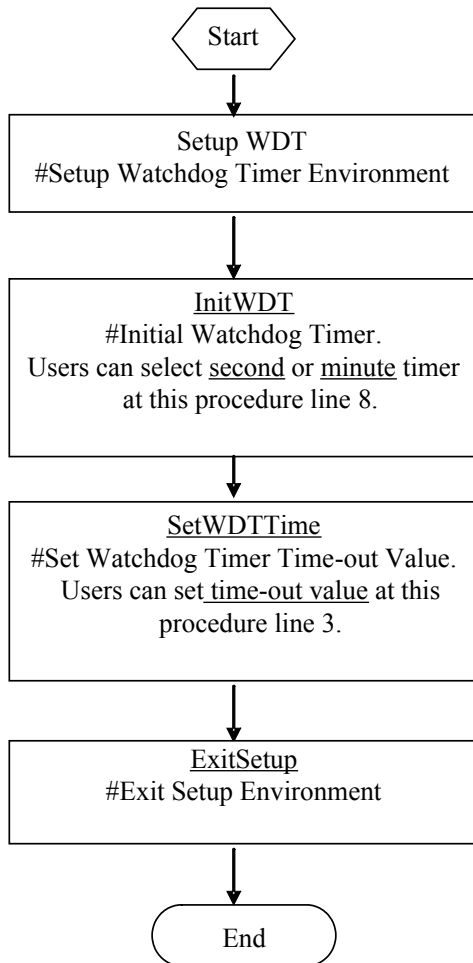
Drivers: Windows 2000/2003, XP, Linux

Certifications: CE approval
 FCC Class A

Environment: Operating temperature: 0°C to 60°C (32°F to 140°F)
 Storage temperature: -20°C to 85°C (-4°F to 185°F)
 Relative humidity: Non-operating 5%~95%, non-condensing

Dimensions: 95mm (W) x 114mm (L) (3.74" x 4.5")

2.3 Watchdog Timer Programming



P.S:Common library

```

=====
===
0 SetupWDT      PROC
1      mov      al,87h
2      out      2eh,al
3      mov      al,01h
4      out      2eh,al
5      mov      al,55h
6      out      2eh,al
7      out      2eh,al
8
9      mov      al,07h
10     out      2eh,al
11     mov      al,07h
12     out      2fh,al
13     ret
14 SetupWDT      ENDP
  
```

```

=====
===
0 InitWDT      PROC
1      mov      al,71h
2      out      2eh,al
3      mov      al,30h
4      out      2fh,al
5
6      mov      al,72h
7      out      2eh,al
8      mov      al,0c0h -Here!! set 0c0h for second, set 40h for minute
9      out      2fh,al
10     ret
  
```

11 InitWDT ENDP

=====

===

0 SetWDTTime PROC

1 mov al,73h

2 out 2eh,al

3 mov al,5 -Here!! Set 5 sec.(time out vale: 0x00-0xff)

4 out 2fh,al

5 ret

6 SetWDTTime ENDP

=====

===

0 ExitSetup PROC

1 mov al,02h

2 out 2eh,al

3 mov al,02h

4 out 2fh,al

5 ret

6 ExitSetup ENDP

=====

===

2.4 ICES 101 Board Layout

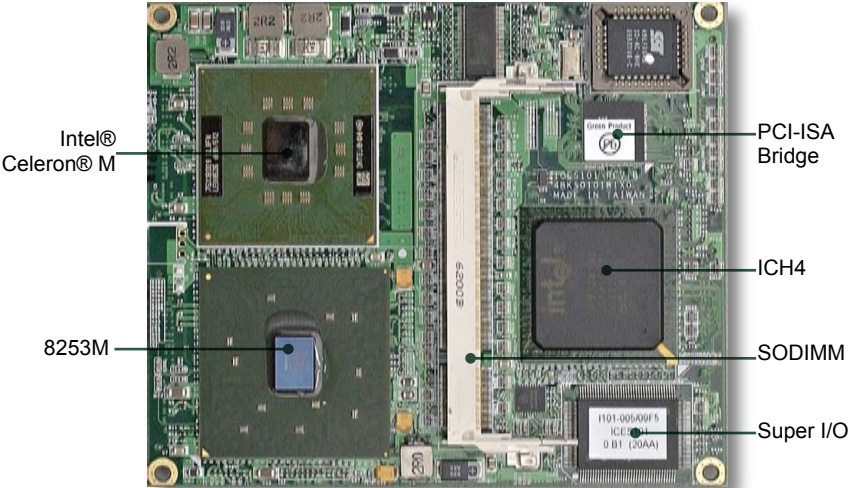


Figure 2.2: ICES 101 top view

2.5 ICES 101 Dimensions

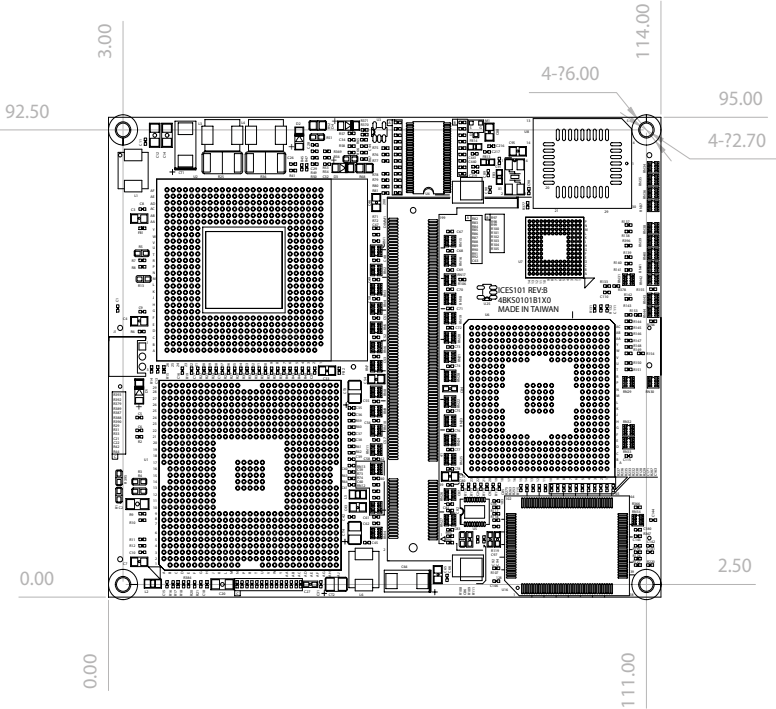


Figure 2.3: ICES 101 Dimensions

2.6 IRQ Assignments

Interrupt request lines let peripherals communicate with the CPU for the function required. The following list shows the IRQs used.

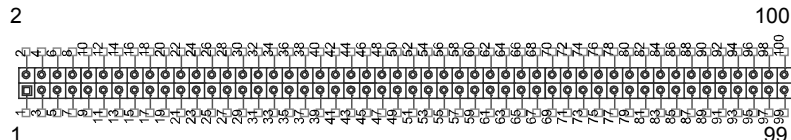
Table 2.1: IRQ assignments
on board.
IRQ0 Timer
IRQ1 KBC
IRQ2 Internal
IRQ3 COMA
IRQ4 COMB
IRQ5 Parallel Port / Generic
IRQ6 FDC
IRQ7 Parallel Port / Generic
IRQ8 RTC
IRQ9 Generic
IRQ10 Generic
IRQ11 Generic
IRQ12 PS/2 Mouse
IRQ13 Internal
IRQ14 IDE1
IRQ15 IDE2

2.7 PCI Device Interrupt and BUS Assignments

The ICES 101 ETX module supports PCI expansion fully compliant with the PCI specification.

Table 2.2: PCI device interrupts				
Chipset	Config. BUS /			
DEVIC/ FUNCTION	PCI INT#	IDSEL	Special feature de- scription	
ETX PCI(1)	0 / 9 /0	ABCD	AD19	ETX
ETX PCI(2)	0 / 10 /0	BCDA	AD20	ETX
ETX PCI(3)	0 / 11 /0	CDAB	AD21	ETX
ETX PCI(4)	0 / 12 /0	ABCD	AD23	ETX
DA82562ET	0 / 8 /0	BCDA	AD24	10/100 PHY
IT8888G	1 / 6 /0		AD22	PCI to ISA BRIDGE

2.8 JP1 : ETX Connector (X1)~PCI BUS, AUDIO OUT, USB



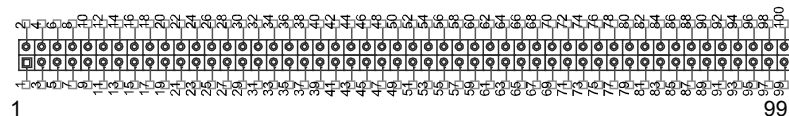
Pin	Definition	Pin	Definition
1	GND	2	GND
3	PCICLK2	4	PCICLK3
5	GND	6	GND
7	PCICLK0	8	PCICLK1
9	REQ3#	10	GNT3#
11	GNT2#	12	+3V
13	REQ2#	14	GNT1#
15	REQ1#	16	+3V
17	GNT0#	18	NC
19	VCC	20	VCC
21	SERIRQ	22	REQ0#
23	AD0	24	+3V
25	AD1	26	AD2
27	AD4	28	AD3
29	AD6	30	AD5
31	CBE0#	32	AD7
33	AD8	34	AD9
35	GND	36	GND
37	AD10	38	AUXAL
39	AD11	40	MIC
41	AD12	42	AUXAR
43	AD13	44	NC
45	AD14	46	SNDL
47	AD15	48	ASGND
49	CBE1#	50	SNDR

Pin	Definition	Pin	Definition
51	VCC	52	VCC
53	PAR	54	SERR#
55	GPERR#	56	NC
57	PME#	58	USB2#
59	LOCK#	60	DEVSEL#
61	TRDY#	62	USB3#
63	IRDY#	64	STOP#
65	FRAME#	66	USB2
67	GND	68	GND
69	AD16	70	CBE2#
71	AD17	72	USB3
73	AD19	74	AD18
75	AD20	76	USB0#
77	AD22	78	AD21
79	AD23	80	USB1#
81	AD24	82	CBE3#
83	VCC	84	VCC
85	AD25	86	AD26
87	AD28	88	USB0
89	AD27	90	AD29
91	AD30	92	USB1
93	PCIRST#	94	AD31
95	INTC#	96	INTD#
97	INTA#	98	INTB#
99	GND	100	GND

2.9 JP2: ETX Connector (X2) ~ ISA BUS

2

100



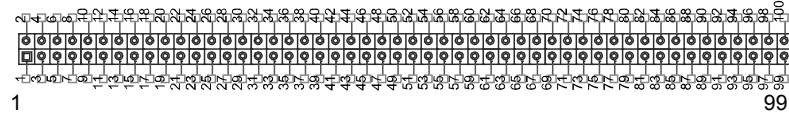
Pin	Definition	Pin	Definition
1	GND	2	GND
3	SD14	4	SD15
5	SD13	6	MASTER#
7	SD12	8	DREQ7
9	SD11	10	DACK7#
11	SD10	12	DREQ6
13	SD9	14	DACK6#
15	SD8	16	DREQ5
17	MEMW#	18	DACK5#
19	MEMR#	20	DREQ0
21	LA17	22	DACK0#
23	LA18	24	IRQ14
25	LA19	26	IRQ15
27	LA20	28	IRQ12
29	LA21	30	IRQ11
31	LA22	32	IRQ10
33	LA23	34	IO16#
35	GND	36	GND
37	SBHE#	38	M16#
39	SA0	40	OSC
41	SA1	42	BALE
43	SA2	44	TC
45	SA3	46	DACK2#
47	SA4	48	IRQ3
49	SA5	50	IRQ4

Pin	Definition	Pin	Definition
51	VCC	52	VCC
53	SA6	54	IRQ5
55	SA7	56	IRQ6
57	SA8	58	IRQ7
59	SA9	60	SYSCLK
61	SA10	62	REFSH#
63	SA11	64	DREQ1
65	SA12	66	DACK1#
67	GND	68	GND
69	SA13	70	DREQ3
71	SA14	72	DACK3#
73	SA15	74	IOR#
75	SA16	76	IOW#
77	SA18	78	SA17
79	SA19	80	SMEMR#
81	IOCHRDY	82	AEN
83	VCC	84	VCC
85	SD0	86	SMEMW#
87	SD2	88	SD1
89	SD3	90	NOWS#
91	DREQ2	92	SD4
93	SD5	94	IRQ9
95	SD6	96	SD7
97	IOCHK#	98	RSTDRV
99	GND	100	GND

2.10 JP4: ETX (X3)~VGA, CLK, VIDEO, COM, LPT, IR, MS/KB

2

100



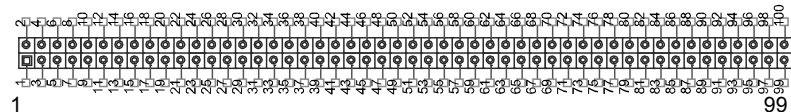
Pin	Definition	Pin	Definition
1	GND	2	GND
3	R	4	B
5	HSY	6	G
7	VSY	8	DDCK
9		10	DDDA
11	LVDS_CLKBM	12	LVDS_YBM3
13	LVDS_CLKBP	14	LVDS_YBP3
15	GND	16	GND
17	LVDS_YBP1	18	LVDS_YBP2
19	LVDS_YBM1	20	LVDS_YBM2
21	GND	22	GND
23	LVDS_YAM3	24	LVDS_YBP0
25	LVDS_YAP3	26	LVDS_YBM0
27	GND	28	GND
29	LVDS_YAM2	30	LVDS_CLKAP
31	LVDS_YAP2	32	LVDS_CLKAM
33	GND	34	GND
35	LVDS_YAP0	36	LVDS_YAP1
37	LVDS_YAM0	38	LVDS_YAM1
39	VCC	40	VCC
41	NC	42	
43	NC	44	BLON#
45	BIASON	46	DIGON
47	NC	48	NC
49	NC	50	NC

Pin	Definition	Pin	Definition
51	NC	52	NC
53	VCC	54	GND
55	STB#	56	AFD#
57	NC	58	PD7
59	IRRX	60	ERR#
61	IRTX	62	PD6
63	RXD2	64	INIT#
65	GND	66	GND
67	RTS2#	68	PD5
69	DTR2#	70	SLIN#
71	DCD2#	72	PD4
73	DSR2#	74	PD3
75	CTS2#	76	PD2
77	TXD2	78	PD1
79	RI2#	80	PD0
81	VCC	82	VCC
83	RXD1	84	ACK#
85	RTS1#	86	BUSY
87	DTR1#	88	PE
89	DCD1#	90	SLCT#
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDAT
95	TXD1	96	KBCLK
97	RI1#	98	KBDAT
99	GND	100	GND

2.11 JP3 : ETX Connector (X4)~IDE, LAN, I2C, SMBUS, MISC

2

100



Pin	Definition	Pin	Definition
1	GND	2	GND
3	5V_SB	4	PWGIN
5	PS_ON	6	SPEAKER
7	PWRBTN#	8	BATT
9	NC	10	LILED#
11	RSMRST#	12	ACTLED#
13	NC	14	SPEEDLED#
15	NC	16	I2CLK
17	VCC	18	VCC
19	OVCR#	20	NC
21	EXTSMI#	22	I2DAT
23	SMBCLK	24	SMBDATA
25	SIDE_CS3#	26	SMBALRT#
27	SIDE_CS1#	28	NC
29	SIDE_A2	30	PIDE_CS3#
31	SIDE_A0	32	PIDE_CS1#
33	GND	34	GND
35	PDIAG_S	36	PIDE_A2
37	SIDE_A1	38	PIDE_A0
39	SIDE_INTRQ	40	PIDE_A1
41	BATLOW#	42	GPE1#
43	SIDE_AK#	44	PIDE_INTRQ
45	SIDE_RDY	46	PIDE_AK#
47	SIDE_IOR#	48	PIDE_RDY
49	VCC	50	VCC

Pin	Definition	Pin	Definition
51	SIDE_IOW#	52	PIDE_IOR#
53	SIDE_DRQ	54	PIDE_IOW#
55	SIDE_D15	56	PIDE_DRQ
57	SIDE_D0	58	PIDE_D15
59	SIDE_D14	60	PIDE_D0
61	SIDE_D1	62	PIDE_D14
63	SIDE_D13	64	PIDE_D1
65	GND	66	GND
67	SIDE_D2	68	PICD_D13
69	SIDE_D12	70	PICD_D2
71	SIDE_D3	72	PIDE_D12
73	SIDE_D11	74	PIDE_D3
75	SIDE_D4	76	PIDE_D11
77	SIDE_D10	78	PIDE_D4
79	SIDE_D5	80	PIDE_D10
81	VCC	82	VCC
83	SIDE_D9	84	PIDE_D5
85	SIDE_D6	86	PIDE_D9
87	SIDE_D8	88	PIDE_D6
89	NC	90	CBLID_P
91	RXD#	92	PIDE_D8
93	RXD	94	SIDE_D7
95	TXD#	96	PIDE_D7
97	TXD	98	HDRST#
99	GND	100	GND

2.12 NICE 3200 Power Consumption

Nice 3200 System Comprised of ICES 101 ETX Module + ICEB 3200 Carrier Board

Table 2.3: NICE 3200 power consumption

System Configuration					
Model Name	OS	Memory	Storage	CPU	AP
NICE 3200	Win XP	1G non-ECC, non-registered DDR SO-DIMM 333 memory	40GB	Intel ULV Celeron® M 600 MHz	K Power + Burning Test
Value	Power Consumption				
Theoretical Current *	32.326W				
Real Current One**	15.84 ~ 16.56W				
Real Current Two***	16.32 ~ 17.52W				
Real Current Three****	12.72 ~ 12.96W				

NOTE:

*Theoretical Current means R&D designed power consideration with Onboard Devices (Does not consider the Add-On devices)

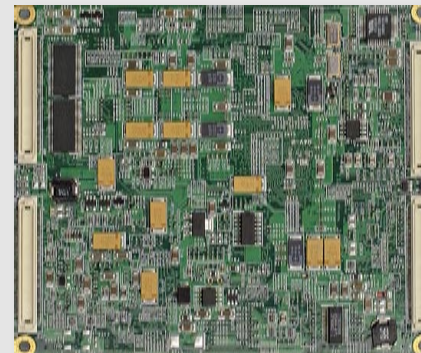
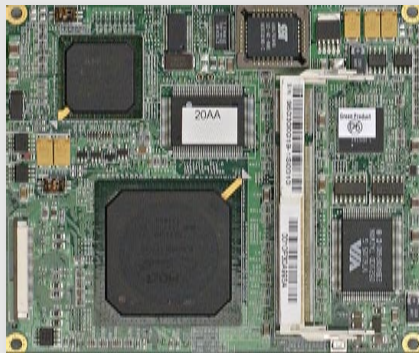
**Real Current One means system with Maximum HD/CPU and Memory Loading/Usage under room temperature.

***Real Current Two means system with 25% HD/70% CPU and 50% Memory Loading/Usage under room temperature.

****Real Current Three means system without running K Power with OS in idle state under room temperature.

Chapter 3 ICES 120 ETX Module Reference

NEXCOM



3.1 ICES 120 Function Block Diagram

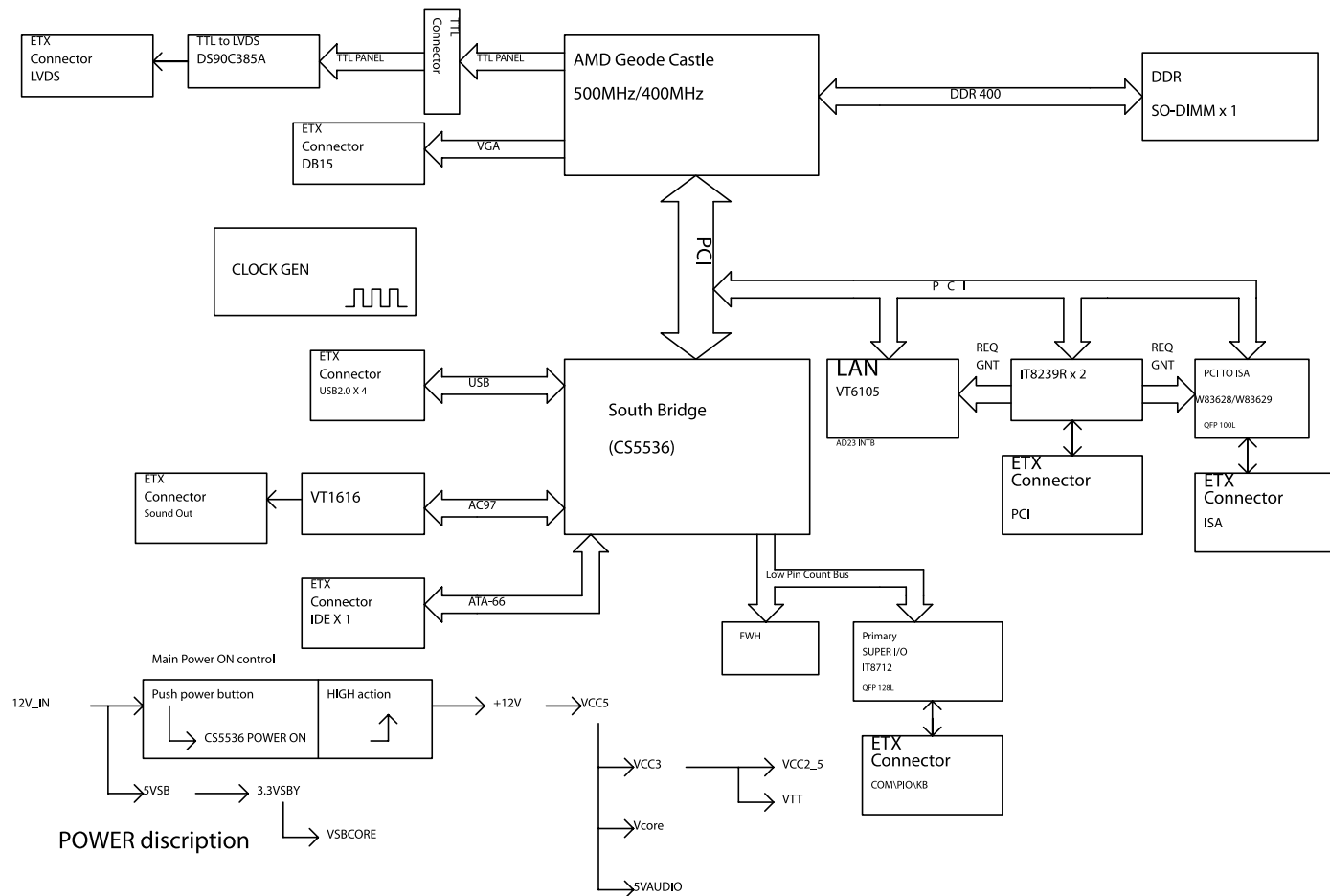


Figure 3.1 ICES 120 Functional Block Diagram

3.2 Electrical Specifications

CPU:	AMD Geode LX800: 64 KB I-cache/64 KB D-cache 128 KB L2 cache
Chipset:	AMD LX800 and CS 5536 companion chip.
System Memory:	Supports up to 1GB DDR in one 200-pin SO-DIMM socket with bus speed of 400 MHz. No ECC non registered DIMM.

NOTE: The AMD Geode LX processor and AMD Geode™ CS5536 companion chipset deliver the low-power x86 performance to design the newest, most innovative and creative products. Coupled with the combined chipset, it operates at 1.9W typical at 433MHz and at 2.4W typical at 500MHz, and offers designers a complete set of features that can deliver full desktop functionality to embedded and portable devices.

Graphics:	Geode LX800 integrated Graphic, supports both standard VGA and TFT.
CRT:	Supports up to 1920 x 1440 at 85 Hz DB15 CRT VGA Connector x 1
LVDS:	Supports up to 24-bit, 1600 x 1200 at 60 Hz for TFT Reserved 45-pin box header for TTL LCD Interface On-board LVDS Transmitter for LVDS Interface down to I/O Board.
Ethernet:	VIA VT6105 10/100 Ethernet.

NOTE: Open LDI 24-bit/18-bit and SPWG 18-bit will apply to LVSD connector J1. SPWG 24-bit will apply to LVDS connector J2.

Audio:	VT1616 CODEC- AC97 Audio interface
Super I/O:	IT8712F
ETX Connectors:	

X1 32-bit/33Mhz PCI x 4

WARNING: ICES120 only supports 3.3V PCI devices.

VT1616 CODEC - AC97 Audio Interface
USB 2.0 x 4
X2 ISA Interface
X3 VGA x 1
LVDS x 1
LPT x 1
KB/Mouse
COM1 and COM2
IrDA
X4 Ethernet (10/100)
SMBus
IDE x 1

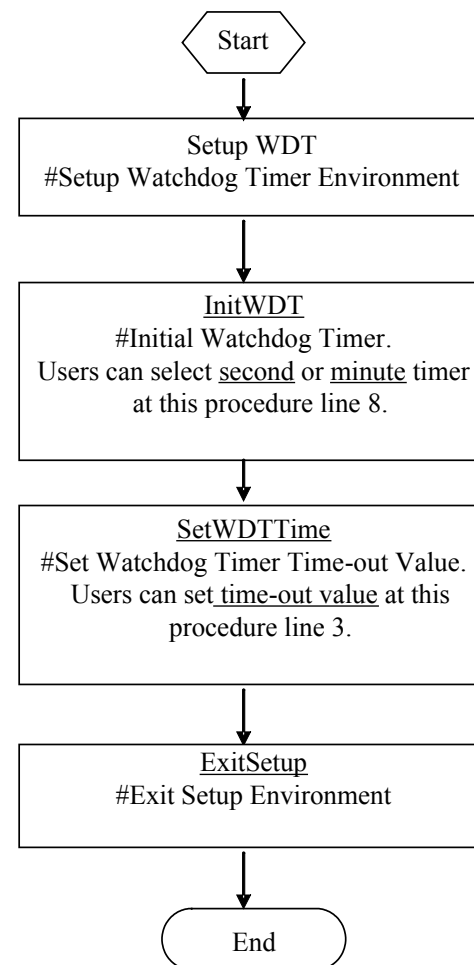
RTC: On-chip RTC with battery back up
External Li-ion Battery x 1 (Socket type field replaceable)
Tolerance less than 2 secs (24 hours) under 25°C environment

WatchDog: Watchdog timeout programmable by software from 1 second to 256 Sec. (Tolerance 25% under room temperature 25°C)

BIOS: Award System BIOS
Advanced Power Management support

	4Mbit flash ROM
Power:	Supports both AT and ATX Power Supply. +5V Power Only, follow ETX Power and Ground Pin Defined
Supply	
Drivers:	Windows 2000/2003, XP, Linux
Certifications:	CE approval FCC Class A
Environment:	Operating temperature: 0°C to 60°C (32°F to 140°F) Storage temperature: -20°C to 85°C (-4°F to 185°F) Relative humidity: Non-operating 5%~95%, non-condensing
Dimensions:	95 mm (W) x 114 mm (L) (3.74" x 4.5")

3.3 Watchdog Timer Programming



P.S:Common library

```
=====
===
```

```
0 SetupWDT      PROC
1      mov      al,87h
2      out      2eh,al
3      mov      al,01h
4      out      2eh,al
5      mov      al,55h
6      out      2eh,al
7      out      2eh,al
8
9      mov      al,07h
10     out      2eh,al
11     mov      al,07h
12     out      2fh,al
13     ret
14 SetupWDT      ENDP
```

```
=====
===
```

```
0 InitWDT        PROC
1      mov      al,71h
2      out      2eh,al
3      mov      al,30h
4      out      2fh,al
5
6      mov      al,72h
7      out      2eh,al
8      mov      al,0c0h -Here!! set 0c0h for second, set 40h for minute
9      out      2fh,al
10     ret
```

```
11 InitWDT      ENDP
```

```
=====
===
```

```
0 SetWDTTime     PROC
1      mov      al,73h
2      out      2eh,al
3      mov      al,5 -Here!! Set 5 sec.(time out vale: 0x00-0xff)
4      out      2fh,al
5      ret
6 SetWDTTime     ENDP
```

```
=====
===
```

```
0 ExitSetup      PROC
1      mov      al,02h
2      out      2eh,al
3      mov      al,02h
4      out      2fh,al
5      ret
6 ExitSetup      ENDP
```

```
=====
===
```

3.4 ICES 120 ETX Module Layout

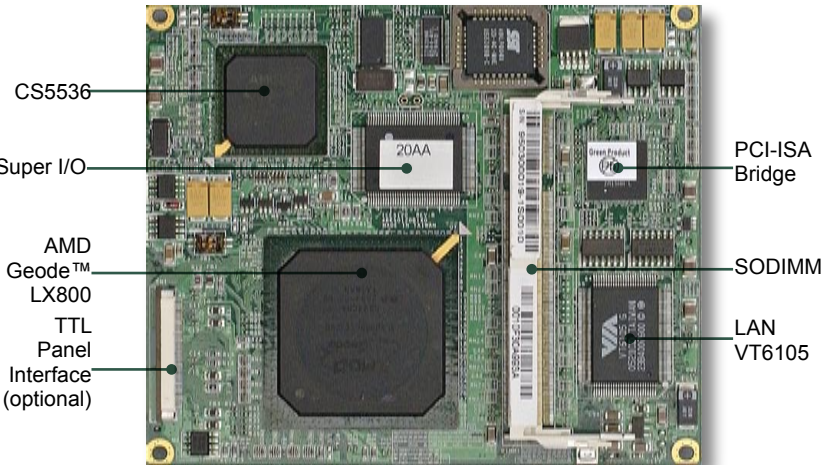


Figure 3.2: ICES 120 top view

3.5 ICES 120 Dimensions

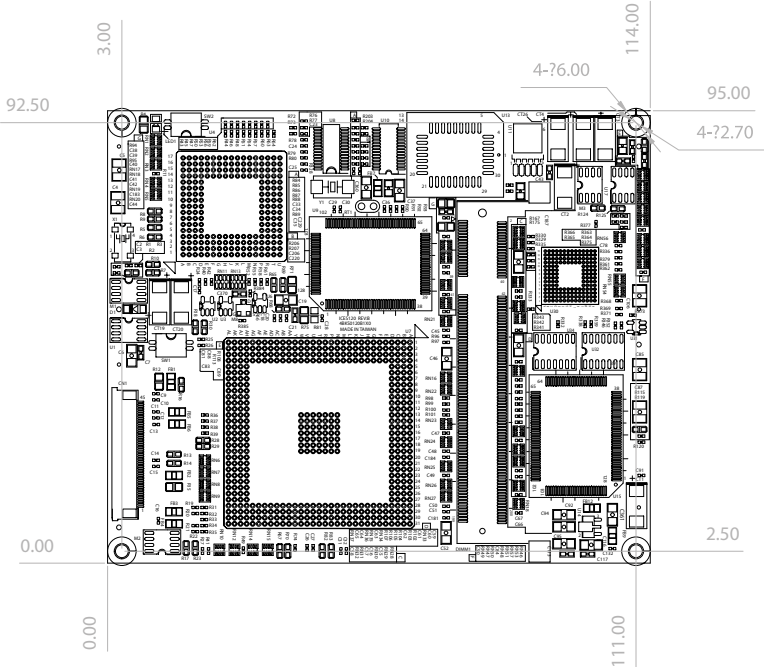


Figure 3.3: ICES 120 board view

3.6 IRQ Assignments

Interrupt request lines let peripherals communicate with the CPU for the function required. The following list shows the IRQs used

Table 3.1: IRQ assignments

IRQ0 Timer
IRQ1 KBC
IRQ2 Cascade
IRQ3 COM2
IRQ4 COM1
IRQ5 COM4
IRQ6 FDC
IRQ7 LPT
IRQ8 RTC
IRQ9 Free (reserved for PCI)
IRQ10 COM3
IRQ11 Free(reserved for PCI)
IRQ12 PS/2 Mouse
IRQ13 Math Co-processor
IRQ14 IDE1
IRQ15 IDE2
Also have three On-board PCI IRQ and add on card IRQ be assigned , the IRQ resource be dynamic
Assigned by BIOS.

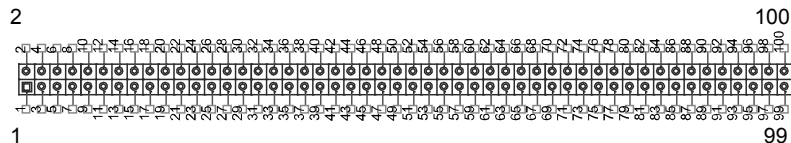
3.7 PCI Device interrupt and BUS Assignments

The ICES 120 ETX module supports PCI expansion fully compliant with the PCI specification.

Table 3.2: PCI device interrupts

Chipset	Config. BUS / DE-VIC/FUNCTION	PCI INT#	IDSEL	Special feature description
AMD Geode Castle	0 / 1 / 1	INTA		Host-Hub Interface Bridge
AMD CS5535/5536	0 / 15 / 4,5			USB 1.1/2.0 Controller
ETX PCI(1)	0 / 9 /0	ABCD	AD19	ETX
ETX PCI(2)	0 / 10 /0	BCDA	AD20	ETX
ETX PCI(3)	0 / 11 /0	CDAB	AD21	ETX
ETX PCI(4)	0 / 12 /0	DABC	AD22	ETX
VT6105G	0 / 13 /0	ABCD	AD23	LAN
IT8888G	0 / 14 /0		AD24	PCI to ISA BRIDGE

3.8 JP1 : ETX Connector (X1)~PCI BUS, AUDIO OUT, USB



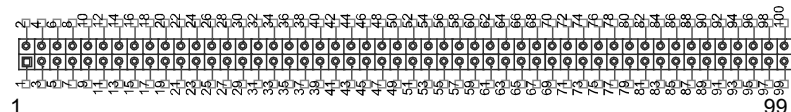
Pin	Definition	Pin	Definition
1	GND	2	GND
3	PCICLK3	4	PCICLK4
5	GND	6	GND
7	PCICLK1	8	PCICLK2
9	REQ3#	10	GNT3#
11	GNT2#	12	+3V
13	REQ2#	14	GNT1#
15	REQ1#	16	+3V
17	GNT0#	18	RESERVED
19	VCC	20	VCC
21	SERIRQ	22	REQ0#
23	AD0	24	+3V
25	AD1	26	AD2
27	AD4	28	AD3
29	AD6	30	AD5
31	CBE0#	32	AD7
33	AD8	34	AD9
35	GND	36	GND
37	AD10	38	AUXAL
39	AD11	40	MIC
41	AD12	42	AUXAR
43	AD13	44	NC
45	AD14	46	SNDL
47	AD15	48	ASGND
49	CBE1#	50	SNDR

Pin	Definition	Pin	Definition
51	VCC	52	VCC
53	PAR	54	SERR#
55	GPERR#	56	RESERVED
57	PME#	58	USB2#
59	LOCK#	60	DEVSEL#
61	TRDY#	62	USB3#
63	IRDY#	64	STOP#
65	FRAME#	66	USB2
67	GND	68	GND
69	AD16	70	CBE2#
71	AD17	72	USB3
73	AD19	74	AD18
75	AD20	76	USB0#
77	AD22	78	AD21
79	AD23	80	USB1#
81	AD24	82	CBE3#
83	VCC	84	VCC
85	AD25	86	AD26
87	AD28	88	USB0
89	AD27	90	AD29
91	AD30	92	USB1
93	PCIRST#	94	AD31
95	INTC#	96	INTD#
97	INTA#	98	INTB#
99	GND	100	GND

3.9 JP2: ETX Connector (X2) ~ ISA BUS

2

100



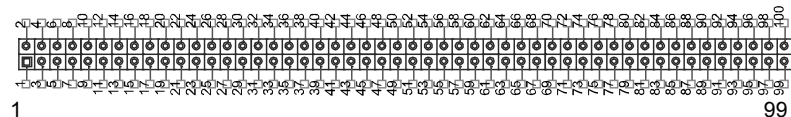
Pin	Definition	Pin	Definition
1	GND	2	GND
3	SD14	4	SD15
5	SD13	6	MASTER#
7	SD12	8	DREQ7
9	SD11	10	DACK7#
11	SD10	12	DREQ6
13	SD9	14	DACK6#
15	SD8	16	DREQ5
17	MEMW#	18	DACK5#
19	MEMR#	20	DREQ0
21	LA17	22	DACK0#
23	LA18	24	IRQ14
25	LA19	26	IRQ15
27	LA20	28	IRQ12
29	LA21	30	IRQ11
31	LA22	32	IRQ10
33	LA23	34	IO16#
35	GND	36	GND
37	SBHE#	38	M16#
39	SA0	40	OSC
41	SA1	42	BALE
43	SA2	44	TC
45	SA3	46	DACK2#
47	SA4	48	IRQ3
49	SA5	50	IRQ4

Pin	Definition	Pin	Definition
51	VCC	52	VCC
53	SA6	54	IRQ5
55	SA7	56	IRQ6
57	SA8	58	IRQ7
59	SA9	60	SYSCLK
61	SA10	62	REFSH#
63	SA11	64	DREQ1
65	SA12	66	DACK1#
67	GND	68	GND
69	SA13	70	DREQ3
71	SA14	72	DACK3#
73	SA15	74	IOR#
75	SA16	76	IOW#
77	SA18	78	SA17
79	SA19	80	SMEMR#
81	IOCHRDY	82	AEN
83	VCC	84	VCC
85	SD0	86	SMEMW#
87	SD2	88	SD1
89	SD3	90	NOWS#
91	DREQ2	92	SD4
93	SD5	94	IRQ9
95	SD6	96	SD7
97	IOCHK#	98	RSTDRV
99	GND	100	GND

3.10 JP4: ETX (X3)~VGA, CLK, VIDEO, COM, LPT, IR, MS/KB

2

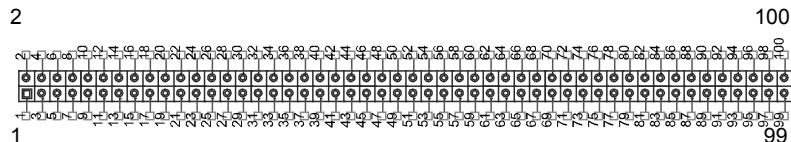
100



Pin	Definition	Pin	Definition
1	GND	2	GND
3	R	4	B
5	HSY	6	G
7	VSY	8	DDCK
9	NC	10	DDDA
11	LCDDO16	12	LCDDO18
13	LCDDO17	14	LCDDO19
15	GND	16	GND
17	LCDDO13	18	LCDDO15
19	LCDDO12	20	LCDDO14
21	GND	22	GND
23	LCDDO8	24	LCDDO11
25	LCDDO9	26	LCDDO10
27	GND	28	GND
29	LCDDO4	30	LCDDO7
31	LCDDO5	32	LCDDO6
33	GND	34	GND
35	LCDDO1	36	LCDDO3
37	LCDDO0	38	LCDDO2
39	VCC	40	VCC
41	NC	42	NC
43	NC	44	BLON#
45	BIASON	46	DIGON
47	NC	48	NC
49	NC	50	NC

Pin	Definition	Pin	Definition
51	NC	52	RESERVED
53	VCC	54	GND
55	STB#	56	AFD#
57	RESERVED	58	PD7
59	IRRX	60	ERR#
61	IRTX	62	PD6
63	RXD2	64	INIT#
65	GND	66	GND
67	RTS2#	68	PD5
69	DTR2#	70	SLIN#
71	DCD2#	72	PD4
73	DSR2#	74	PD3
75	CTS2#	76	PD2
77	TXD2	78	PD1
79	RI2#	80	PD0
81	VCC	82	VCC
83	RXD1	84	ACK#
85	RTS1#	86	BUSY
87	DTR1#	88	PE
89	DCD1#	90	SLCT#
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDAT
95	TXD1	96	KBCLK
97	RI1#	98	KBDAT
99	GND	100	GND

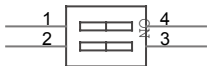
3.11 JP3 : ETX Connector (X4)~IDE, LAN, I2C, SMBUS, MISC



Pin	Definition	Pin	Definition
1	GND	2	GND
3	5V_SB	4	PWGIN
5	PS_ON	6	SPEAKER
7	PWRBTN#	8	BATT
9	NC	10	LILED#
11	RSMRST#	12	ACTLED#
13	NC	14	SPEEDLED#
15	NC	16	I2CLK
17	VCC	18	VCC
19	OVCR#	20	NC
21	EXTSMI#	22	I2DAT
23	SMBCLK	24	SMBDATA
25	NC	26	SMBALRT#
27	NC	28	NC
29	NC	30	PIDE_CS3#
31	NC	32	PIDE_CS1#
33	GND	34	GND
35	NC	36	PIDE_A2
37	NC	38	PIDE_A0
39	NC	40	PIDE_A1
41	BATLOW#	42	GPE1#
43	NC	44	PIDE_INTRQ
45	NC	46	PIDE_AK#
47	NC	48	PIDE_RDY
49	VCC	50	VCC

Pin	Definition	Pin	Definition
51	NC	52	PIDE_IOR#
53	NC	54	PIDE_IOW#
55	NC	56	PIDE_DRQ
57	NC	58	PIDE_D15
59	NC	60	PIDE_D0
61	NC	62	PIDE_D14
63	NC	64	PIDE_D1
65	GND	66	GND
67	NC	68	PICD_D13
69	NC	70	PICD_D2
71	NC	72	PIDE_D12
73	NC	74	PIDE_D3
75	NC	76	PIDE_D11
77	NC	78	PIDE_D4
79	NC	80	PIDE_D10
81	VCC	82	VCC
83	NC	84	PIDE_D5
85	NC	86	PIDE_D9
87	NC	88	PIDE_D6
89	NC	90	CBLID_P
91	RXD#	92	PIDE_D8
93	RXD	94	NC
95	TXD#	96	PIDE_D7
97	TXD	98	HDRST#
99	GND	100	GND

3.12 LVDS on/off switch (SW1)



Pin	Definition
1	Connector J2 on
2	Connector J1 on

3.13 ATX/AT mode selector (SW2)



Pin	Definition
1	AT on
2	ATX on

3.14 NICE 3220 Power Consumption

Nice 3220 System Comprised of ICES 120 ETX Module + ICEB 3200 Carrier Board

Table 3.3: NICE 3220 power consumption					
System Configuration					
Model Name	OS	Memory	Storage	CPU	AP
NICE 3220	Win XP	1G non-ECC, non-registered DDR SO-DIMM 333 memory	40GB	AMD Geode LX800	K Power + Burning Test
Value	Power Consumption				
Theoretical Current *	12.7659W				
Real Current One**	11.76W~10.08W				
Real Current Two***	10.56W~10.08W				
Real Current Three****	9.36W~8.88W				

NOTE:

*Theoretical Current means R&D designed power consideration with Onboard Devices (Does not consider the Add-On devices)

**Real Current One means system with Maximum HD/CPU and Memory Loading/Usage under room temperature.

***Real Current Two means system with 25% HD/70% CPU and 50% Memory Loading/Usage under room temperature.

****Real Current Three means system without running K Power with OS in idle state under room temperature.

Chapter 4 ICEB 3200 Carrier Board Reference

NEXCOM



4.1 ICEB 3200 Board Layout

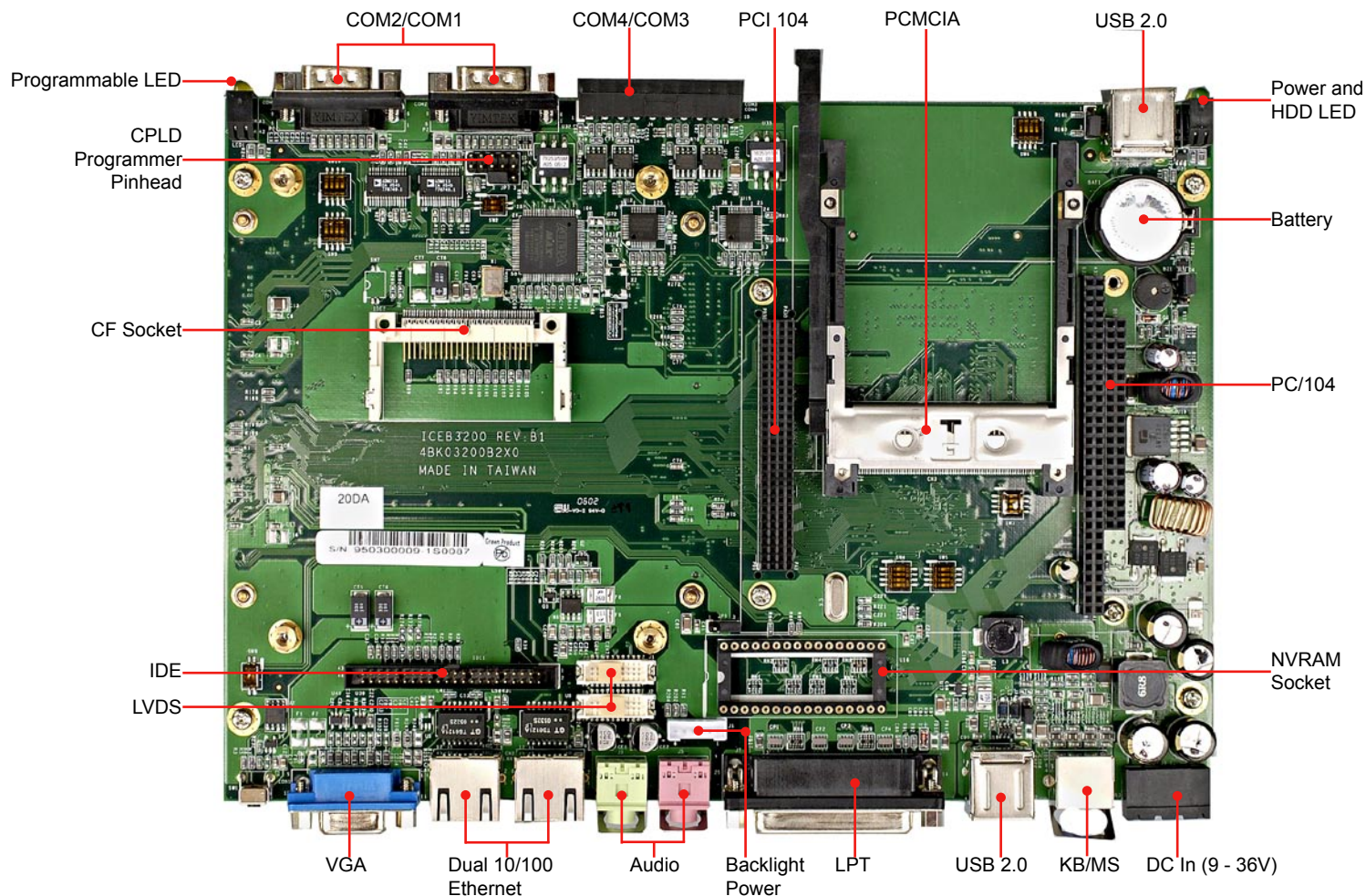
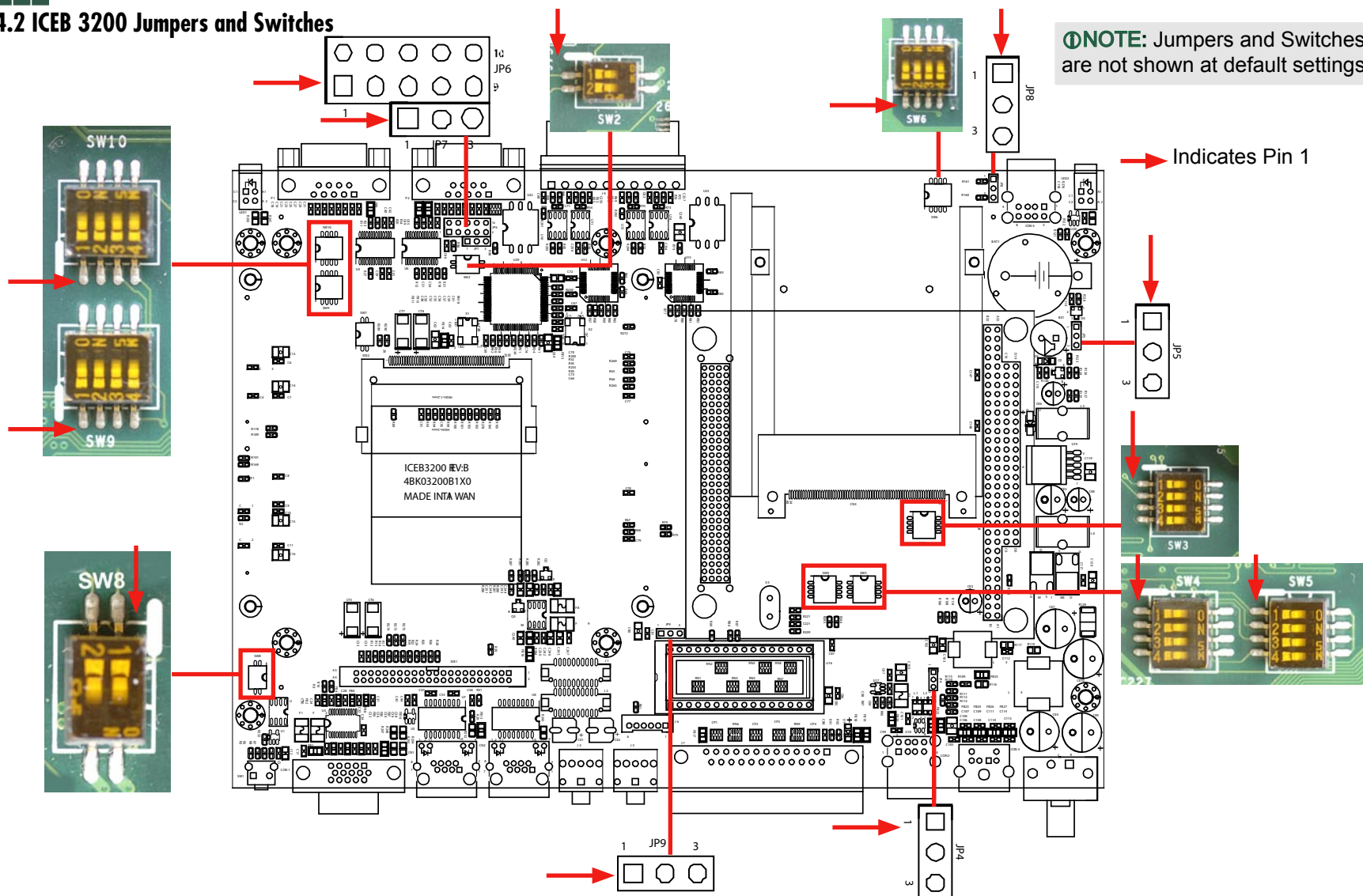


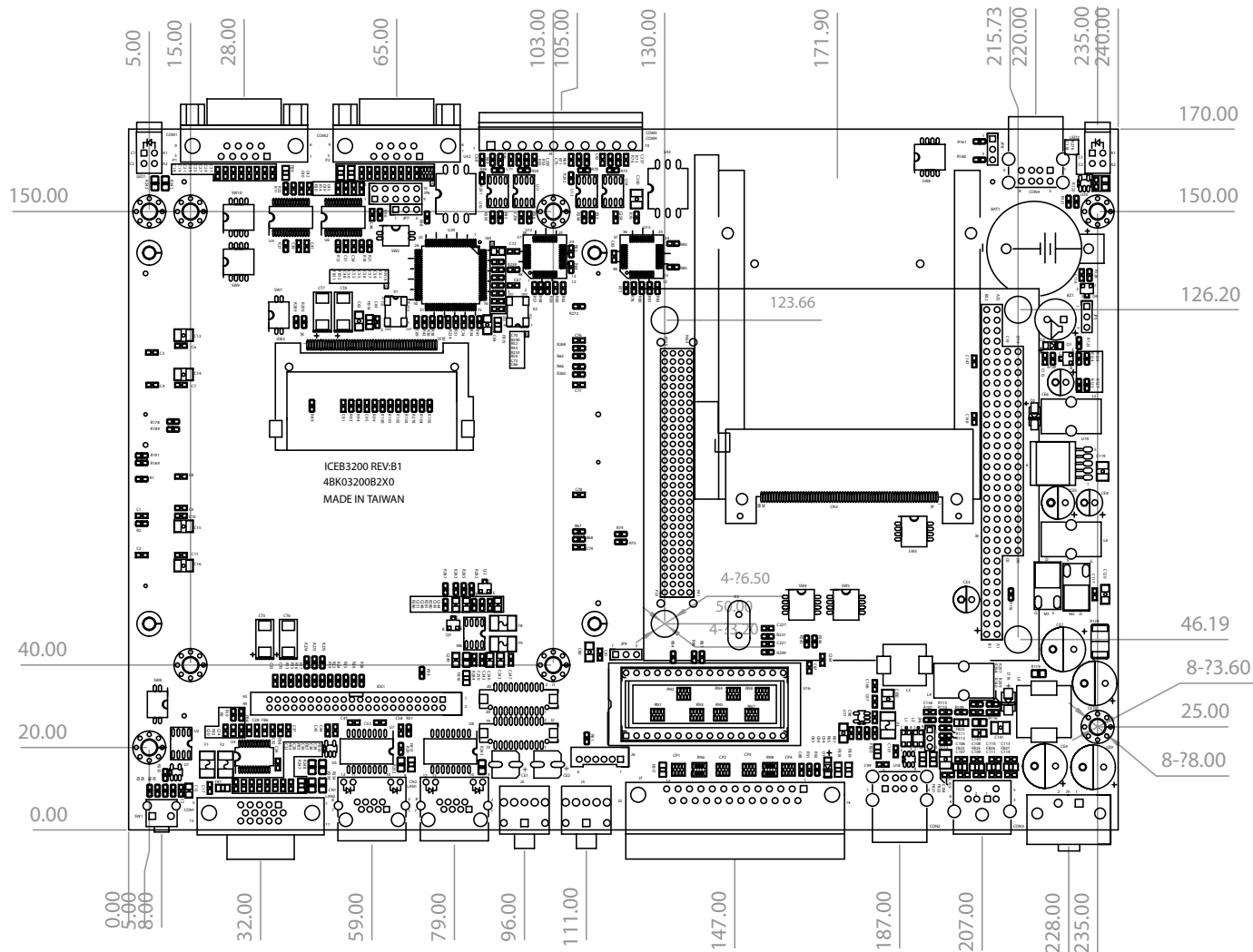
Figure 4.1: ICEB 3200 Board Layout

4.2 ICEB 3200 Jumpers and Switches

NOTE: Jumpers and Switches are not shown at default settings.



4.3 ICEB 3200 Dimensions



4.4 ICEB 3200 Specifications

IDE

Internal CompactFlash socket x 1 (Primary IDE)

External Access Compact Flash Socket x 1 (Secondary IDE)

NOTE: External access compact flash socket is only available for ICES101. With the ICES 120, there is no 2nd CF socket support.

44-pin IDE Connector x 1 (Primary IDE)

COM Ports

COM 1 ~ 2 from ETX Module support RS232

COM 3 ~ 4 via ISA Interface, support RS422/485

Automatic RS-485 data flow control

Optical Isolation, Max 2KV

±15KV ESD protected

10-pin Screw Terminal Connector (Pin assignment: TBD)

Speed: RS-422/485: 50 ~ 921.6 Kbps

USB 2.0

USB 2.0 Ports x 2 in the Front

USB 2.0 Ports x 2 in the Rear

PIO

LPT Port x 1 ; 25-pin D-type supporting bi-directional, EPP and ECP modes

Audio

From ETX Module:

Audio Out

Mic In

Graphics

From ETX Module:

Internal LVDS Interface

Hirose DF13-20DP x 2 for Dual Pixels LVDS

External Display Interface by Analog CRT DB15 VGA Connector

Ethernet

From ETX Module:

10/100 Fast Ethernet, RJ45 with LED connector x 1

Carrier Board with On Fast Ethernet LAN Chip VIA VT6105 via PCI Interface. RJ45 with LED Connector x 1

Expansion

PC/104-Plus (ISA+PCI) x 1

PCMCIA Socket x 1

Supports CardBus 32-bit and 16-bit cards

Power Supply

On-board DC to DC circuit support Power Input Range from +9V to +36VDC.

Standard Configuration for NICE 3200 series models is +24VDC Input

WARNING: If you use 9V~12V voltage, please change the JP4 to 1-2, and not +12V and -12V power output. Default JP4 is 3-4 while you use 13V~36V voltage.

LED and Others

On-board buzzer

One Reset Switch and Power LED and CF/HDD status LED

Two LEDs Connect to GPIO, that is programmable for Alarm or other purposed defined by developer. Provide User Interface Utility of Windows 2K/XP and Linux for user to configure the Alarm Status of Thermal or Voltage status on the front LEDs.

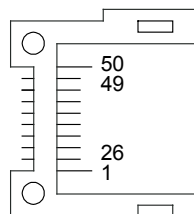
Operating temperature: -20°C to +60°C (-4°F to 140°F)

SRAM

Reserved NVRAM Socket for the Optional 512 KB battery backed SRAM (NVRAM)

External Connectors for NICE 3200 and 3220

4.5 CompactFlash Connector IDE2 (Slave), IDE3 (Master)

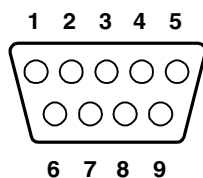


Pin No.	Description	Pin No.	Description
1	Gnd	2	Data 3
3	Data 4	4	Data 5
5	Data 6	6	Data 7
7	HDC CS100	8	Gnd
9	Gnd	10	Gnd
11	Gnd	12	Gnd
13	+5V	14	Gnd
15	Gnd	16	Gnd
17	Gnd	18	Disk Address 2
19	Disk Address 1	20	Disk Address 0
21	Data 0	22	Data 1
23	Data 2	24	IOCS16# (NC)
25	CF_CD2# (Pull-down)	26	CF_CD1# (Pull-down)

27	Data 11	28	Data 12
29	Data 13	30	Data 14
31	Data 15	32	HDC CS300
33	CF_VS1# (NC)	34	IOR
35	IOW	36	CF_WE# (+5V)
37	Interrupt 15	38	+5V
39	CF_CSEL# (Master or Slave)	40	CF_VS2# (NC)
41	Reset #	42	IOCHRDY
43	DMA REQ / DACK (NC)	44	DMA ACK# / CF_REG# (+5V)
45	HDD Active Led	46	DMA66 Detect / CF_PDIAG#
47	Data 8	48	Data 9
49	Data 10	50	Gnd

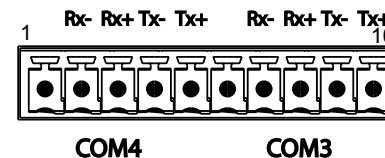
4.6 SIO connector COM1(P1),COM2(P2)

The ICEB3200 provides two D-sub 9-pin connectors, which offers standard 232 serial communication interface port of COM1/COM2.



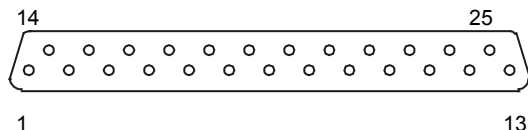
Pin	Definition	Pin	Definition
1	Data Carrier Detect#	2	Serial Input
3	Serial Output	4	Data Terminal Ready#
5	Chassis Gnd	6	Data Set Ready#
7	Request To Send#	8	Clear To Send#
9	Ring Indicator#		

4.7 RS422/485 COM3,COM4(J4)~COM3 : IRQ10 , COM4 : IRQ5



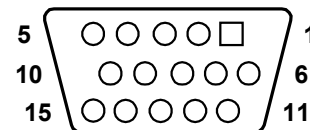
Pin	Definition	Pin	Definition
1	COM3/ RS422/485 TX+	2	COM3/ RS422/485 TX-
3	COM3/RS422 RX+	4	COM3/RS422 RX-
5	Gnd	6	COM4/ RS422/485 TX+
7	COM4/ RS422/485 TX+	8	COM4/RS422 RX+
9	COM4/RS422 RX-	10	Gnd

4.8 PIO connector (J7)



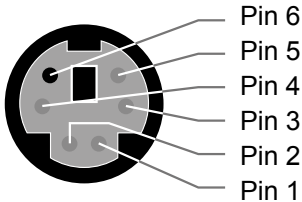
Pin	Definition	Pin	Definition
1	Line Print Strobe	2	Parallel Data 0
3	Parallel Data 1	4	Parallel Data 2
5	Parallel Data 3	6	Parallel Data 4
7	Parallel Data 5	8	Parallel Data 6
9	Parallel Data 7	10	Acknowledge
11	BUSY	12	Paper empty
13	Select	14	Auto feed
15	Error	16	Initialize
17	Select input	18	Chassis Gnd
19	Chassis Gnd	20	Chassis Gnd
21	Chassis Gnd	22	Chassis Gnd
23	Chassis Gnd	24	Chassis Gnd
25	Chassis Gnd	26	Chassis Gnd

4.9 VGA connector (CON1)



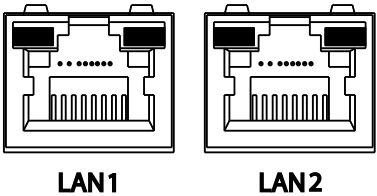
Pin	Definition	Pin	Definition
1	RED	2	GREEN
3	BLUE	4	NC
5	Gnd	6	Gnd
7	Gnd	8	Gnd
9	KEY	10	Gnd
11	NC	12	ID1
13	Hsync	14	Vsync
15	ID3		

4.10 Keyboard + mouse connector (CON3)



Pin	Definition	Pin	Definition
1	KBDData-	2	MouseData
3	Gnd	4	VCC
5	KBClk	6	MouseClk

4.11 LAN connector (CN2,LAN1 : CN1, LAN2)



Pin	Definition	Pin	Definition
1	TX+	2	TX-
3	RX+	4	LAN1
5	LAN1	6	RX-
7	LAN2	8	LAN2
9	LAN Speed LED	10	Vcc3
11	LAN Link LED	12	LAN ACT LED#

4.12 Line out connector (J3)



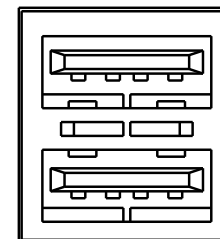
Pin	Definition	Pin	Definition
1	Gnd	2	SNDL
3	SNDR	4	Gnd
5	Gnd		

4.13 MIC connector (J5)



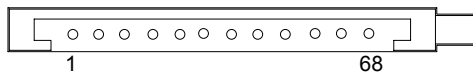
Pin	Definition	Pin	Definition
1	Gnd	2	MIC_IN
3	VCC5	4	Gnd
5	Gnd		

4.14 USB connector (CON2:USB0/1,CON4:USB2/3)



Pin No.	Description	Pin No.	Description
1	VCC5	2	USB-
3	USB+	4	USB Gnd
5	VCC5	6	USB1-
7	USB1+	8	USB Gnd

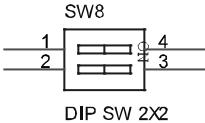
4.15 PCMCIA connector (CN3)



Pin	Definition	Pin	Definition
1	Gnd	35	Gnd
2	D3	36	CO1#
3	D4	37	D11
4	D5	38	D12
5	D6	39	D13
6	D7	40	D14
7	CE1#	41	D15
8	A10	42	CE2#
9	OE#	43	VS1
10	A11	44	IORD#
11	A9	45	IOWR#
12	A8	46	A17
13	A13	47	A18
14	A14	48	A19
15	WE#	49	A20
16	Ready	50	A21
17	Vcc	51	Vcc

18	VPP	52	VPP
19	A16	53	A22
20	A15	54	A23
21	A12	55	A24
22	A7	56	A25
23	A6	57	VS2#
24	A5	58	Reset
25	A4	59	WAIT#
26	A3	60	INPACK#
27	A2	61	REG#
28	A1	62	BVD2
29	A0	63	BVD1
30	D0	64	D8
31	D1	65	D9
32	D2	66	D10
33	WP	67	CO2#
34	Gnd	68	Gnd

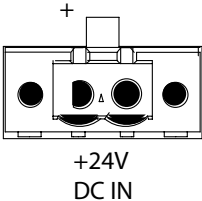
4.16 System RESET Select Switch (SW8)



Pin	Definition
1~4	Power Good in*
2~3	Resume Reset

* default setting

4.17 DC Power input Voltage (J9)



Pin No.	Function Description
1	GND
2	+9V~+36V DC INPUT

4.18 GPIO LED I/O PORT Address & DATA

A1



A2

LED No.	Function Description
A1	I/O PORT Address : EEEH DATA : 01H(LIGHT) 02H(DART)
A2	I/O PORT Address : EEEH DATA : 04H(LIGHT) 08H(DART)

4.19 POWER ON & IDE Active LED (LED2)

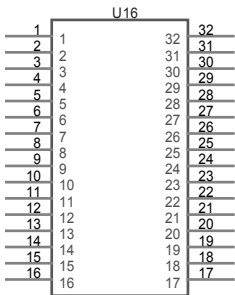
PWR



HDD

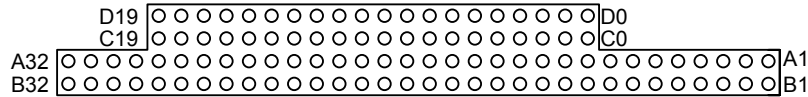
Internal Connectors for NICE 3200 and 3220

4.20 VRAM PIN Defined(U16)



Pin No.	Description	Pin No.	Description
1	ISA A18	17	ISA D3
2	ISA A16	18	ISA D4
3	ISA A14	19	ISA D5
4	ISA A12	20	ISA D6
5	ISA A7	21	ISA D7
6	ISA A6	22	ROM CS#
7	ISA A5	23	ISA A10
8	ISA A4	24	BMEMR#
9	ISA A3	25	ISA A11
10	ISA A2	26	ISA A9
11	ISA A1	27	ISA A8
12	ISA A0	28	ISA A13
13	ISA D0	29	BMEMW#
14	ISA D1	30	ISA A17
15	ISA D2	31	ISA A15
16	GND	32	+5V

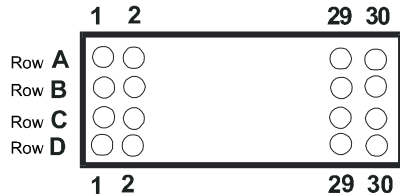
4.21 PC/104-PLUS connector (J8A~ISA)



Pin	D	C
0	GND	GND
1	MEMCS16*	SBHE*
2	IOCS16*	LA23
3	IRQ10	LA22
4	IRQ11	LS21
5	IRQ12	LS20
6	IRQ15	LS19
7	IRQI4	LA18
8	DACK0*	LA17
9	DRQ0	MEMR*
10	DACK5*	MEMW*
11	DRQ5	SD8
12	DACK6*	SD9
13	DRQ6	SD10
14	DACK7*	SD11
15	DRQ7	SD12
16	+5V	SD13
17	MASTER*	SD14
18	GND	SD15
19	GND	GND/KEY

Pin	A	B
1	IOCHCK*	GND
2	D7	RSTDRV
3	D6	+5V
4	D5	IRQ9
5	D4	N/A
6	D3	DRQ2
7	D2	-12V
8	D1	ENDXFR*
9	D0	+12V
10	IOCHRDY	GND/KEY
11	AEN	SMEMW*
12	A19	SMEMR*
13	A18	IOW*
14	A17	IOR*
15	A16	DACK3*
16	A15	DRQ3
17	A14	DACK1*
18	A13	DRQ1
19	A12	REFRESH*
20	A11	SYSCLK
21	A10	IRQ7
22	A9	IRQ6
23	A8	IRQ5
24	A7	IRQ4
25	A6	IRQ3
26	A5	DACK2*
27	A4	TC
28	A3	BALE
29	A2	+5V
30	A1	OSC
31	A0	GND
32	GND	GND

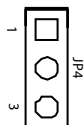
4.22 PC/104-PLUS connector (PCI)



Pin	Definition			
	A	B	C	D
1	Gnd/5.0V KEY	Reserved	+5V	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	Gnd	AD04	AD03
4	C/BE0#	AD07	Gnd	AD06
5	Gnd	AD09	AD08	Gnd
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	Gnd	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	SB0#	PAR
10	Gnd	PERR#	+3.3V	SDONE
11	STOP#	+3.3V	LOCK#	Gnd
12	+3.3V	TRDY#	Gnd	DEVSEL#
13	FRAME#	Gnd	IRDY#	+3.3V
14	Gnd	AD16	+3.3V	C/BE2#

15	AD18	+3.3V	AD17	Gnd
16	AD21	AD20	Gnd	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	Gnd	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O	IDSE;3
20	Gnd	AD26	AD25	Gnd
21	AD29	+5V	AD28	AD27
22	+5V	AD30	Gnd	AD31
23	REQ0#	Gnd	REQ1#	VI/O
24	Gnd	REQ2#	+5V	GNT0#
25	GNT1#	VI/O	GNT2#	Gnd
26	+5V	CLK0	Gnd	CLK1
27	CLK2	+5V	CLK3	Gnd
28	Gnd	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	Reserved	Reserved	Gnd/3.3V KEY

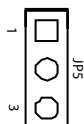
4.23 DC Adapter Input Voltage Select (JP4)



Pin No.	Status	Function Description
1-2	Short	9V-12V (NO +12V and -12v)
2-3	Short*	13V-36V

* default setting

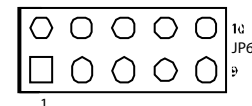
4.24 CMOS Input Voltage Select (JP5)



Pin No.	Status	Function Description
1-2	Short*	VBAT IN
2-3	Short	Clear CMOS

* default setting

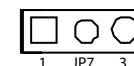
4.25 CPLD Programmer PIN Header(JP6)



Pin	Definition	Pin	Definition
1	TCK	2	GND
3	TDO	4	+3.3V
5	TMS	6	N/A
7	N/A	8	N/A
9	TDI	10	+3.3V

* default setting

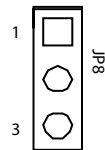
4.26 CF(IDE2) Primary Master/Slave Select (JP7)



Pin No.	Status	Function Description
1-2	Short*	Slave
2-3	Short	Master

* default setting

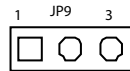
4.27 CF(IDE3) Secondary Master/Slave Select (JP8)



Pin No.	Status	Function Description
1-2	Short	Slave
2-3	Short*	Master

* default setting

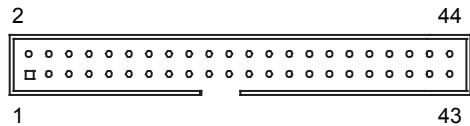
4.28 LVDS Power input Voltage Select (JP9)



Pin No.	Status	Function Description
1-2	Short	+5V IN
2-3	Short*	+3.3V IN

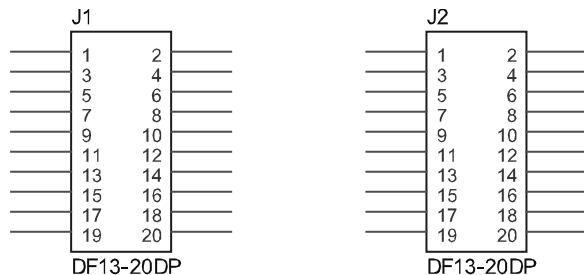
* default setting

4.29 IDE Connector (IDE1)



Pin	Definition	Pin	Definition
1	Rstdrv-	2	Gnd
3	Ided7	4	Ided 8
5	Ided 6	6	Ided 9
7	Ided 5	8	Ided 10
9	Ided 4	10	Ided 11
11	Ided 3	12	Ided 12
13	Ided 2	14	Ided 13
15	Ided 1	16	Ided 14
17	Ided 0	18	Ided 15
19	Gnd	20	NC
21	Idereq-	22	Gnd
23	Ideiow-	24	Gnd
25	Ideior-	26	Gnd
27	Iderdy	28	IDE-PD1
29	Ideack-	30	Gnd
31	Ideirq	32	NC
33	DA1	34	66 Detect
35	DA0	36	DA2
37	SCS1	38	SCS3
39	Ideact-	40	Gnd
41	VCC5	42	VCC
43	Gnd	44	NC

4.30 LVDS connector (J1,J2)



LVDS connector J1

Pin	Definition	Pin	Definition
1	LVDS_CLK	2	LVDS_DAT
3	Panel_VDD	4	LVDS_1
5	LVDS_9	6	LVDS_0
7	LVDS_8	8	Panel_VDD
9	GND	10	LVDS_3
11	LVDS_7	12	LVDS_2
13	LVDS_6	14	GND
15	GND	16	Panel_back-light
17	LVDS_5	18	Panel_back-light
19	LVDS_4	20	GND

LVDS connector J2

Pin	Definition	Pin	Definition
1	LVDS_CLK	2	LVDS_DAT
3	Panel_VDD	4	LVDS_11
5	LVDS_19	6	LVDS_10
7	LVDS_18	8	Panel_VDD
9	GND	10	LVDS_13
11	LVDS_17	12	LVDS_12
13	LVDS_16	14	GND
15	GND	16	Panel_back-light
17	LVDS_15	18	Panel_back-light
19	LVDS_14	20	GND

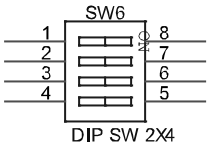
4.31 COM3(SW9),COM4(SW10) IRQ Select switch



COM3(SW9)		COM4(SW9)	
Pin	Definition	Pin	Definition
1~8	IRQ12	1~8	IRQ12
2~7	IRQ10*	2~7	IRQ10
3~6	IRQ5	3~6	IRQ5*
4~5	IRQ6	4~5	IRQ6

* default setting

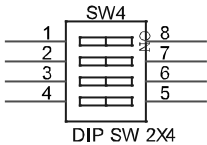
4.32 R5C485(U27) IDSEL Select switch (SW6)



SW6	
Pin	Definition
1~8	AD19*
2~7	AD23
3~6	AD27
4~5	AD31

* default setting

4.33 PC/104-PLUS (J8B) IDSEL Select switch (SW4,SW5)

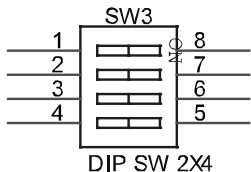


IDSEL0(SW4)		IDSEL1(SW5)	
Pin	Definition	Pin	Definition
1~8	AD16	1~8	AD17
2~7	AD20*	2~7	AD21*
3~6	AD24	3~6	AD25
4~5	AD28	4~5	AD29

* default setting

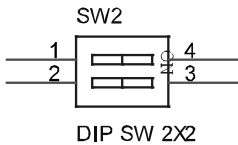
4.34 VT6105G(U28) IDSEL Select switch (SW3)

4.35 RS485/422 Autoswitch Select switch (SW2)



SW3	
Pin	Definition
1~8	AD18
2~7	AD22
3~6	AD26*
4~5	AD30

* default setting



SW2	
Pin	Definition
1~4	
COM3*	ON : RS422 Slave and RS485 Autodetect and Autoswitch
	OFF : RS422 Master
2~3	
COM4*	ON : RS422 Slave and RS485 Autodetec and Autoswitch
	OFF : RS422 Master

* default setting

Chapter 5 3200/3220 Reference and Installation

NECOM



5.1 Packing List for NICE 3200 Series

Quick Start Guide x 1	
CD with driver and user manual x1	
IDE cable x 1	P/N: 60233IDE54X0
PS/2 keyboard/mouse cable x 1	P/N: 60233MK202X0
2-pin power terminal block x1	P/N: 4NCPF00204X0
10-pin RS422/485 terminal block x1	P/N: 4NCPF01002X0

Optional:

Power Adapter (24V out) x 1	P/N: 7400050002X0
-----------------------------	-------------------

If any of these items are missing or damaged, contact your local Nexcom distributor or sales representative immediately. Your Nexcom products should be free of defects and in perfect working order upon receipt.

While unpacking, check for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace

5.2 Specifications

Construction: Aluminum chassis with fanless design

Dimensions: 195mm (W) x 268mm (D) x 80mm (H)

Main board: ICES120
ICES101

I/O Board: ICEB 3200

Model

Configuration: NICE 3200 ICES 101 + ICEB 3200
NICE 3220 ICES 120 + ICEB 3200

Main memory: One 200-pin SODIMM socket for up to 1GB Non-ECC Non-Registered DDR SDRAM memory

Device: NICE 3200: On-board CompactFlash socket x 2
(internal x 1, external x 1)
NICE 3220: On-board CompactFlash socket x 1
Internal 2.5" HDD Drive bay x 1

Front I/O Ports: Power / HDD Status LEDs
2 LEDs, connect to GPIO, programmable for Alarm or other purpose defined by developer
PCMCIA Socket x 1
DB9 COM1 and COM2
Screw Terminal COM3 and COM4
External access CompactFlash Socket (2nd CompactFlash available NICE 3200 only)
USB 2.0 x 2

Rear I/O Ports: RJ45 with LED connector x 2
USB 2.0 Ports x 2
KB Mouse connector
+24V DC Power Input

Power Reset Button
VGA Connector (DB15)
Audio Out and Mic In Connector.
LPT Port x 1

Expansion Slots:

PCMCIA Slot x1:
Supports CardBus 32-bit and 16-bit cards
PC/104-Plus (ISA+PCI):
Supports ISA device x1 / PCI device x2
NVRAM Socket: NICE3200 only

Power Supply: DC to DC power design on-board support
9V DC ~ 36V DC (Max. 50W) Optional External 60W
AC adapter x1

NOTE: If you use 9V~12V voltage, please change the JP4 to 1-2, and no +12V and -12V power output. Default JP4 is 3-4 while you use 13V~36V voltage.

Environment:

Operating

Temperature: Ambient with air:
5°C to 40°C (HDD) (41°F to 104°F)
-10°C to 50°C (CF) (14°F to 122°F)
Tcase (Surface Temperature of Chassis)
5°C ~ 45°C (HDD) (41°F to 113°F)
-10°C ~ 50°C (CF) (14°F to 122°F)

Storage

Temperature: -20°C to 80°C (-4°F to 176°F)

Relative

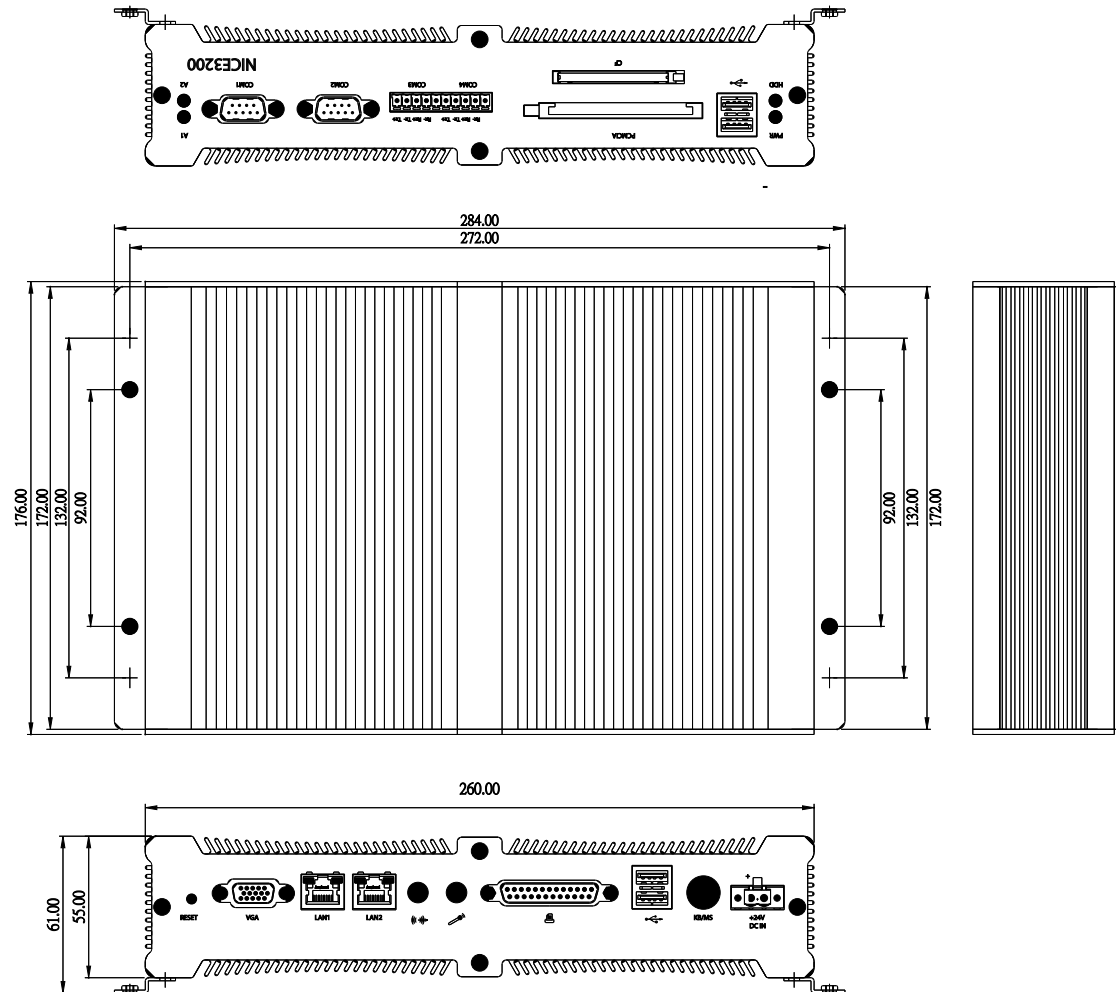
Humidity: 10% to 90% (Non-condensing)

Certifications: CE approval /FCC Class A

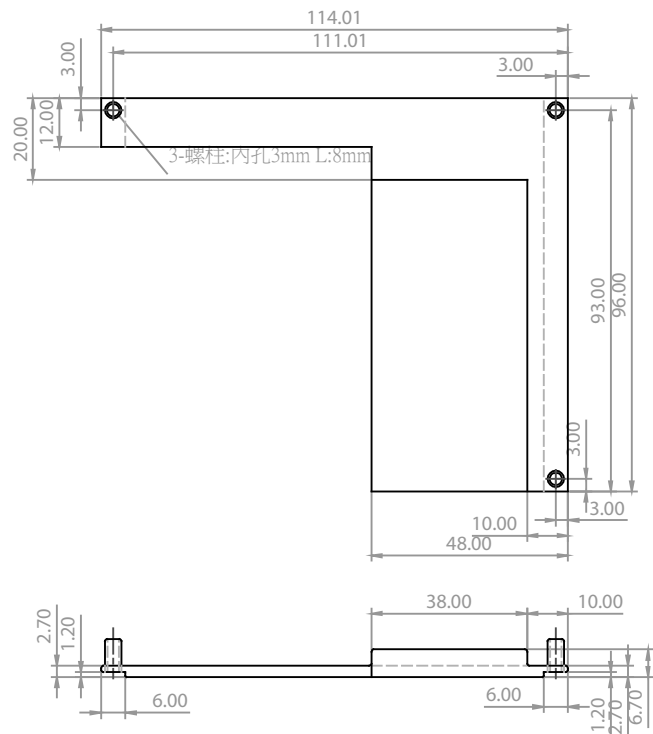
Software: Windows® XP, Windows® 2000/2003, Linux

5.3 NICE 3200/3220 Dimensions

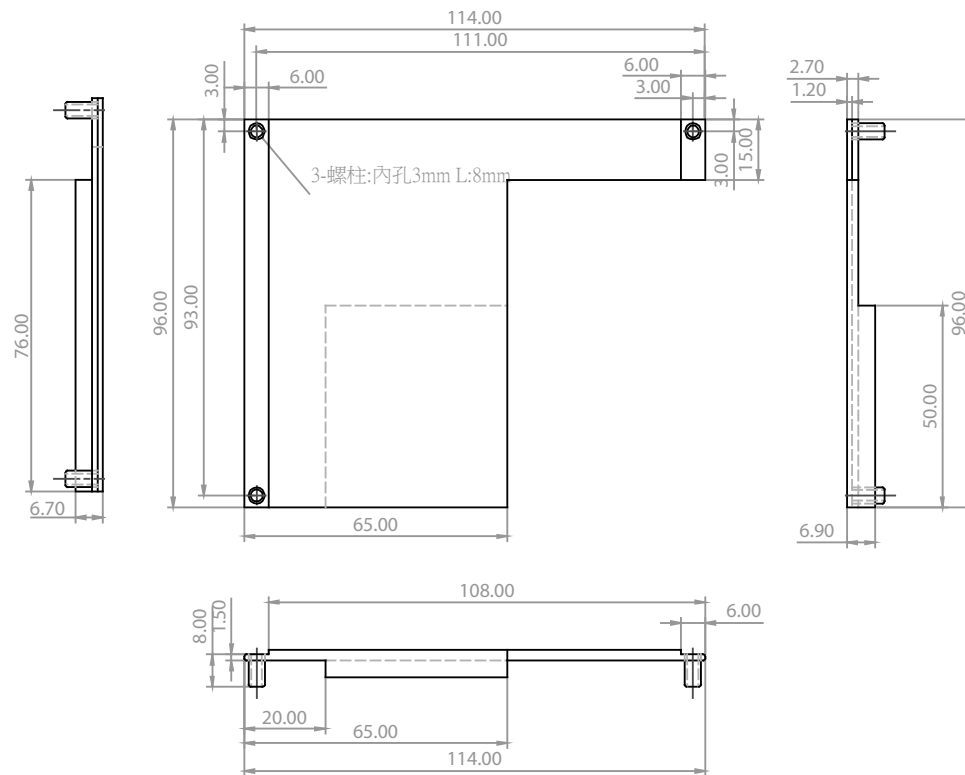
NOTE: NICE 3200 and 3220 external physical dimensions are identical. Only the faceplates are different.



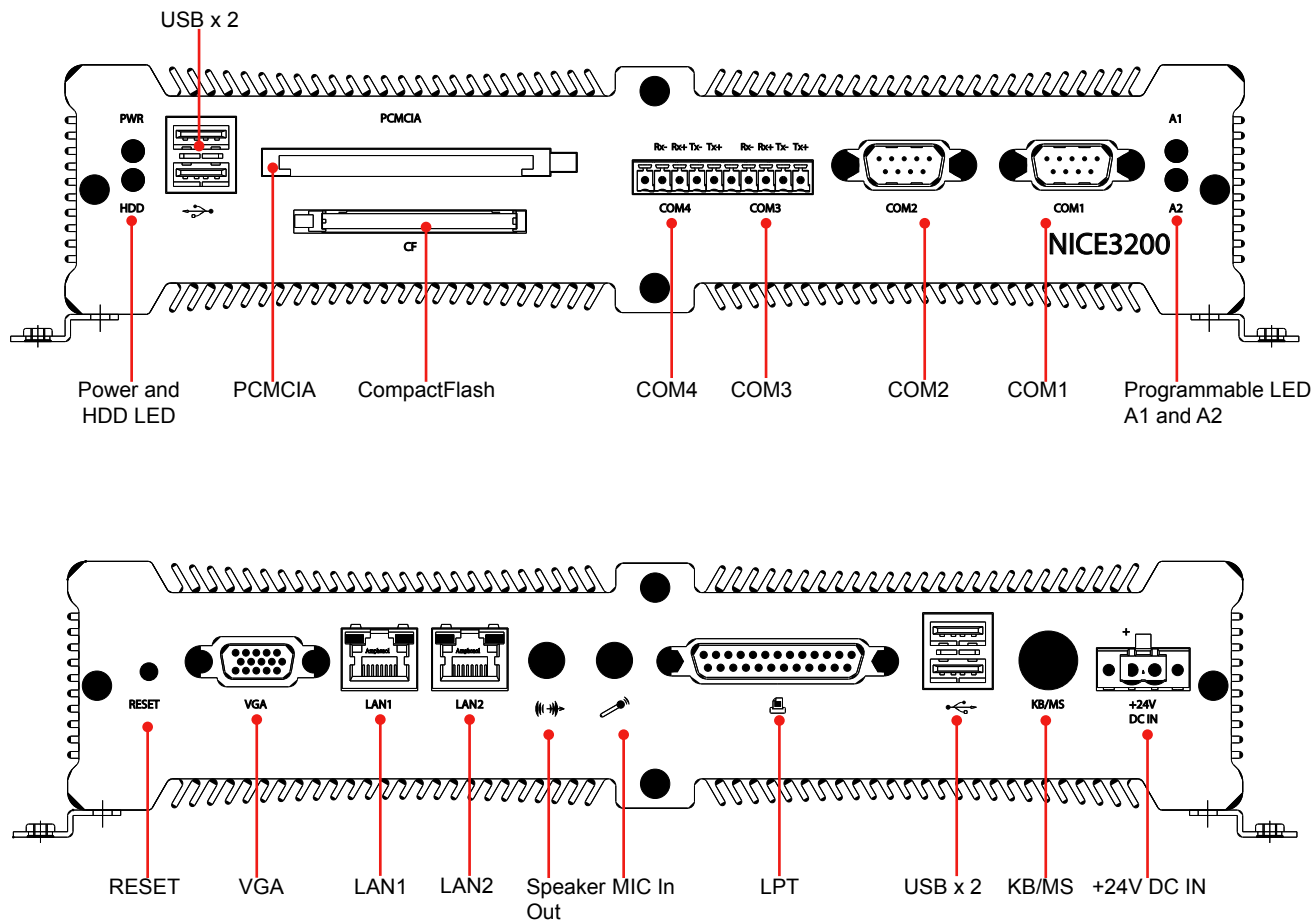
5.4 NICE 3200 Heatsink Dimensions (for ICES 101)



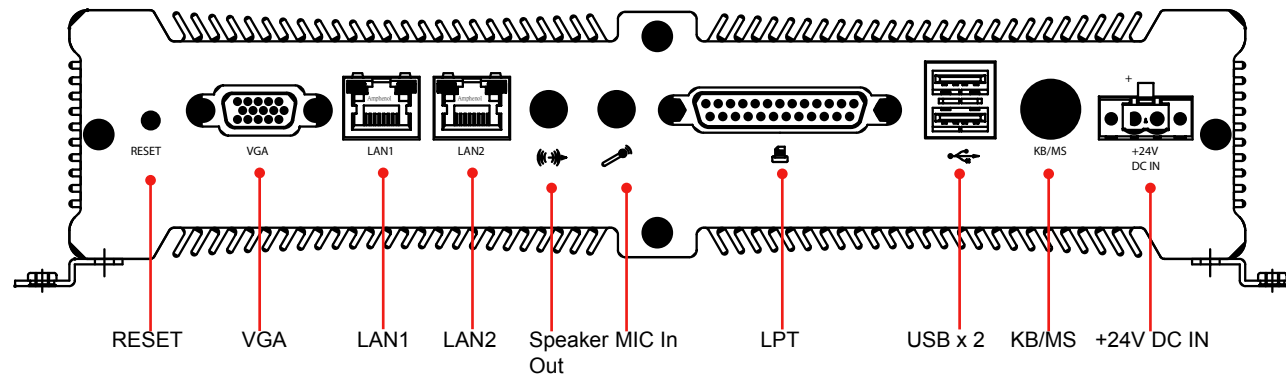
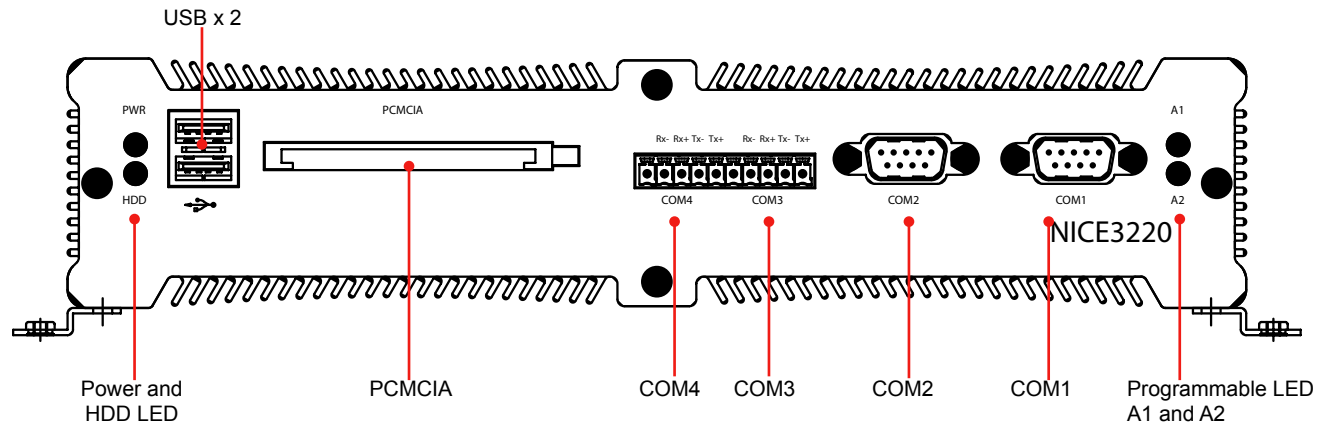
5.5 NICE 3220 Heatsink Dimensions (for ICES 120)



5.6 NICE 3200 Front and Back Layout



5.7 NICE 3220 Front and Back Layout



5.8 NICE 3200/3220 Disassembly Procedures

NOTE: If you would like to slide off the top cover only, just the front or back faceplate needs to be removed (only one). For example, to install a HDD you only need to remove the top cover of the chassis.

1. Remove the green COM 3 and COM 4 and Power connectors from front and back cover plate.



3. Remove the front cover plate.



2. Unscrew the 4 screws from the front and back cover plate.



4. Remove the back cover plate.



5. With front and back faceplates removed, slide the top cover off from either the front or the back.



6. View with front and back faceplates removed, and top cover off.



7. With the top cover off, now slide the right and left side plates off.

NOTE: Each side plate is connected to the base with a male and female groove



8. View with front/back faceplates, sides and cover removed.

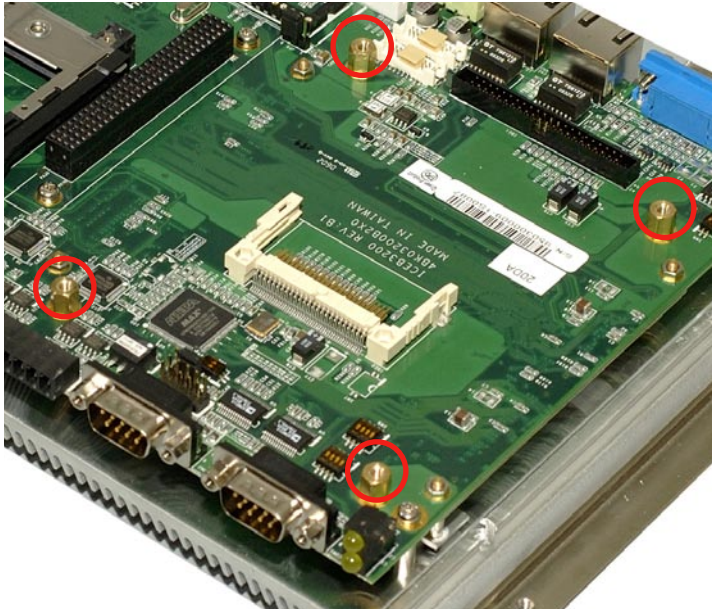


5.9 Installing the HDD Mounting Kit

NOTE: If you would like to slide off the top cover, only the front or back faceplate needs to be removed (only one). For example, for installing a HDD you only need to remove the top cover of the chassis.

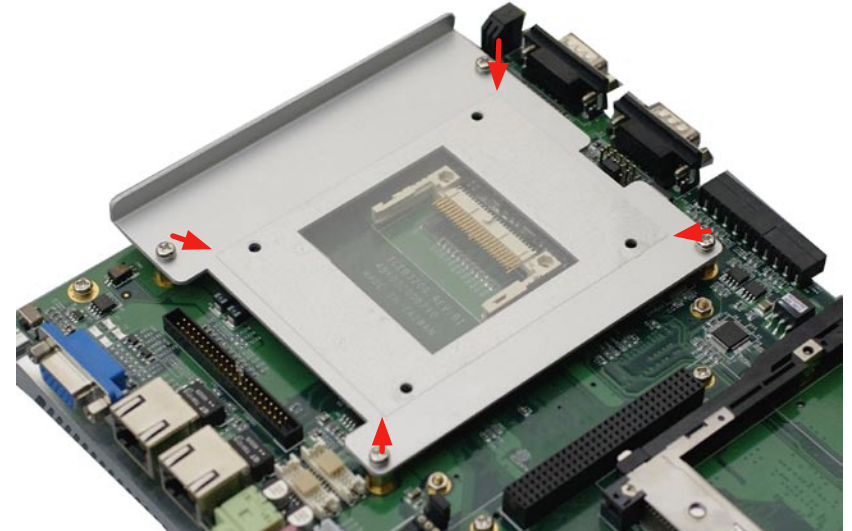
With front and back faceplates and top cover removed, it would be the correct time to install the HDD kit if you wanted.

1. First, locate the HDD mounting holes on the ICEB 3200 carrier board as shown below.



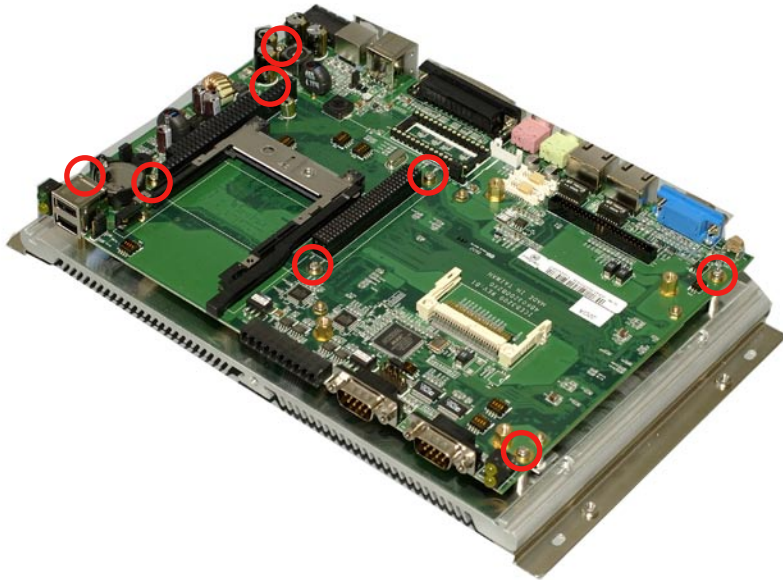
2. The HDD kit comes with a mounting bracket, a cable, some screws and a plastic EMI shield. Since the plastic shield does not come attached, you need to stick it on the bracket as shown in the figure below. The same red arrows mark the corners of the plastic shield.

Connect the HDD bracket with 4 screws as shown below and apply the EMI plastic shield. There are also 4 holes used to mount the HDD to the bracket. It is okay to make holes through the EMI shield for these screws, since it will overlap at least two of these HDD mounting holes.

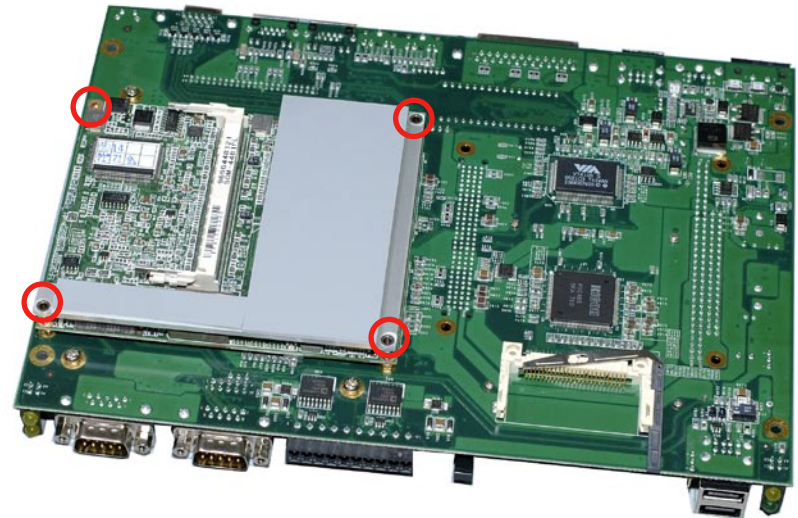


5.10 Continuing the Disassembly

1. With front and back faceplates and top cover removed, to continue with the disassembly remove the 8 screws holding the ICEB 3200 carrier board to the NICE 3200/3220 chassis base.



2. After removing the ICEB 3200 carrier board, flip the board over to find the ETX module with heatsink.

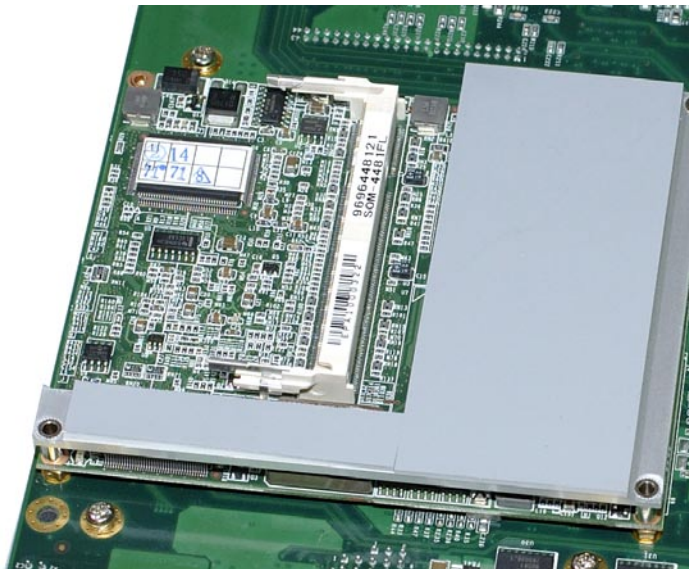


5.11 Installing SODIMM Memory

At this point, now would be the time to change the memory if you wanted. Please remember that your NICE 3200/3220 comes with memory preinstalled.

Install the memory just as you would regularly SODIMM. Line up the memory pins correctly coming in at an angle, start the pins and push in and down until the sides of the memory snaps into the clip.

⚠ WARNING: When you install memory into the socket, make sure to tilt it 45 degrees and then slide it in. Be sure to read the memory installation instructions to prevent damaging the memory during installation.



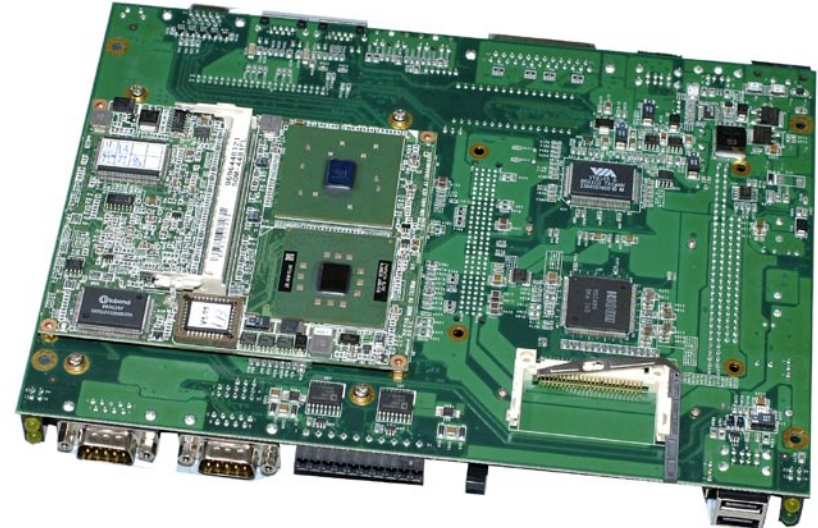
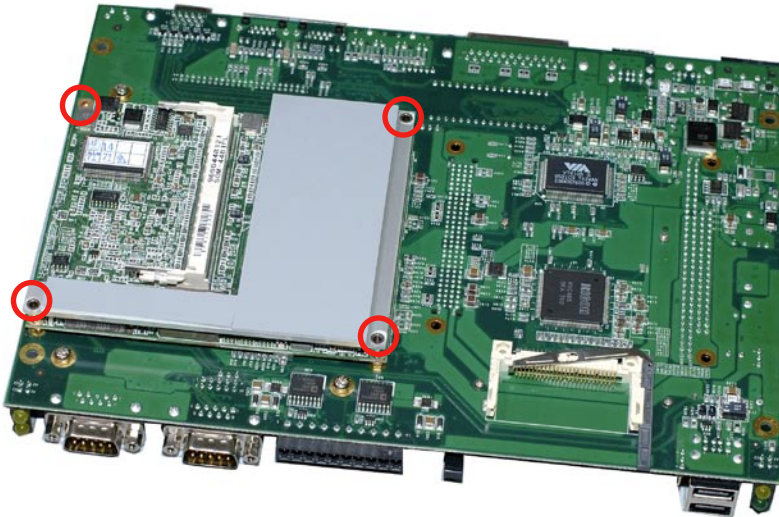
The NICE 3200/3220 Chassis base shown below. Notice the 8 supports to mount the ICEB 3200 carrier board.



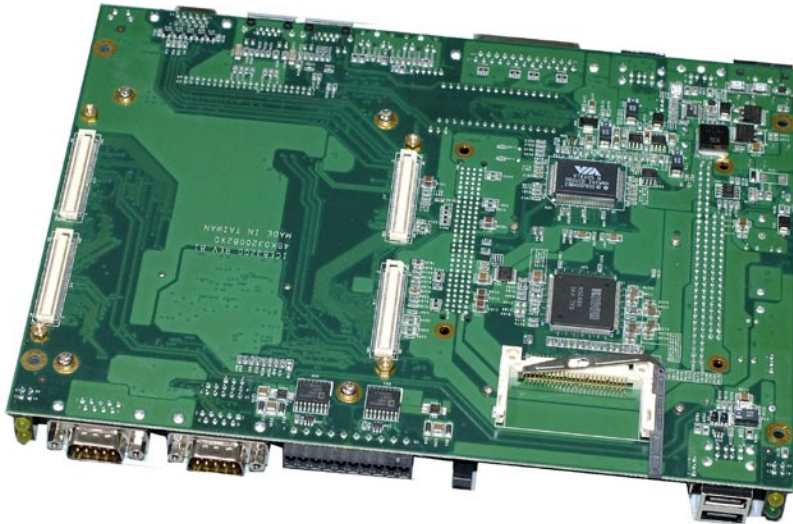
5.12 Removing the ICES 101/120 ETX Module and Heatsink

1. To remove the heatsink and ETX module, remove the 4 screws at the corner of the ETX module. Please note these same 4 screws also secure the heatsink.

2. With the ETX module mounting screws removed, simply pull up on the module on four corners to pop the module out of the four ETX sockets that connect to the carrier board.



The backside view of the ICEB 3200 Carrier board with ICES 101/120 ETX Module removed.



3. To reassemble, just reverse the steps.

Appendix A 3200/3220 Expansion Kit Solutions

NEXCOM



A.1 NICE 3200/3220 Expansion Kit Installation

1. Starting with the standard NICE 3200/3220 with front faceplate and top cover removed.



3. Slide on the side extensions from the expansion kit.



2. Prepare the expansion kit (DIY Kit shown).



4. Then slide on the top cover.



5. Ready to install Rear expansion face plate (DIY Kit shown).



7. Install Front faceplate from expansion kit (Upgrade Kit shown).



6. Fasten Rear expansion face plate



Appendix B ETX Module Comparison Reference

B.1 ETX Comparison Table

Table B.1 ETX Cross Comparison Table				
	KONTRON	ADLINK	ICES120	ICES101
X1	Full function	Full function	lacks function Pin44: ASVCC	lacks function: Pin44: ASVCC
X2	Full function	Full function	Full function	Full function
X3	Full function	Full function	lacks function: Pin9: DETECT# Pin41: JILI_DAT Pin42: LTGIO0 Pin43: JILI_CLK Pin47: COMP Pin48: Y Pin49: SYNC Pin50: C Pin51: LPT/FLPY#	lacks function: Pin9: DETECT# Pin41: JILI_DAT Pin42: LTGIO0 Pin43: JILI_CLK Pin47: COMP Pin48: Y Pin49: SYNC Pin50: C Pin51: LPT/FLPY#
X4	Full function	function: Pin13: ROMKBCS# Pin15: EXT_PRG Pin20: GPCS# Pin28: DASP_S	lacks function: Pin9: KBINH# Pin13: ROMKBCS# Pin15: EXT_PRG Pin20: GPCS# Pin28: DASP_S Secondary IDE	lacks function: Pin9: KBINH# Pin13: ROMKBCS# Pin15: EXT_PRG Pin20: GPCS# Pin28: DASP_S
X5	N/A	N/A	N/A	N/A

Appendix C NICE Series Comparison Reference

C.1 NICE Series Comparison Table

Table C.1 NICE Series Comparison Table					
Models	NICE 3100	NICE 3150	NICE 3120	NICE 3200	NICE 3220
CPU Board Inside	Assy EBC 573FL	Assy EBC 573FL	Assy EBC 420	Assy ICES 101	Assy ICES 120
Processor Support	Intel Pentium M/ Celeron M	Intel Pentium M/ Celeron M	AMD Geode LX800 (GX3)	Intel Pentium M/ Celeron M	AMD Geode LX800 (GX3)
Chipset	Intel 852GM	Intel 852GM	AMD LX800 & CS5536	Intel 852GM	AMD LX800 & CS 5536
Max. Memory Support	2GB (DIMM x 2)	2GB (DIMM x 2)	1GB (DIMM x 1)	1GB (SO-DIMM x 1)	1GB (SO-DIMM x 1)
Hard disk Space	2.5" HDD Bay * 1	2.5" HDD Bay * 1	2.5" HDD Bay * 1	2.5" HDD Bay * 1	2.5" HDD Bay * 1
CF Socket	One (Internal)	One (Internal)	One (Internal)	Two (Internal & External)	One (Internal)
CDROM/DVDROM	No	Slim DVD Combo * 1	No	No	No
VGA	Yes	Yes	Yes	Yes	Yes
LVDS	Dual Pixels LVDS Max. 48 bits	Dual Pixels LVDS Max. 48 bits	Internal TTL LCD Interface Reserved	Internal TTL LCD Interface Reserved	Internal TTL LCD Interface Reserved
DVI	Yes (Occupied PCI Slot)	No	No	No	No
TV Out	Yes	Yes	No	No	No
IEEE1394	No	No	Yes	No	No
Parallel Port	No	Yes	Yes	Yes	Yes
Serial Interface	4 x COM	4 x COM	4 x COM	4 x COM	4 x COM
RS422/485 support	Yes (x 1)	Yes (x1)	No	Yes (x 2)	Yes (x2)
422/485 Isolation & AutoFlow Control	No	No	No	Yes	Yes
LAN Ports	10/100 LAN x 2	10/100 Lan x 2	10/100 LAN x 2	10/100 LAN x 2	10/100 LAN x 2
Audio	Mic in x Spk out	Mac in & Spk out	Spk out only	Mic in x Spk out	Mic in x Spk out
Power Input Range	12Vdc ~ 30VDC	12VDC ~ 30VDC	12VDC	9 ~ 36 VDC	9 ~ 36 VDC
Power Supply Adapter	AC Adapter 120W	AC Adapter 120W	AC Adapter 65W x 1	No (Optional)	No (Optional)
Expansion	PCI slot x 1	No	Mini-PCI Socket x 1 PCI/104 + (PCI only)	PCMCIA x 1 PC/104-Plus	PCMCIA x 1 PC/104-Plus
Upgrade Expansion Kit	No	No	No	Yes	Yes
Dimensions (mm)	195 x 268 x 80	195 x 268 x 80	195 x 150 x 80	260 x 176 x 55	260 x 176 x 55
Operating Temperature	On Ambient w/airflow: 0°C ~ 40° C				
	On Tcase (Chassis Hottest Point): 5°C ~ 45°C with HDD / -10°C ~ 50°C with CF				

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