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# Em104-i290K

## PC/104 CPU Module

### Quick Installation Guide

Version 1.0

Form Factor
<i>PC/104 CPU Module</i>

CPU
<i>Intel® Atom™ N455 Processor</i>

Chipset
<i>Intel® ICH8M</i>

Video
<i>Analog RGB/ Single Channel 18-bit LVDS</i>

LAN
<i>2 x Intel® 82583V PCIe Gigabit Ethernet</i>

I/O
<i>PC104 / USB / SATA / COM / CompactFlash Type II</i>

### ◆ Technical Support

If you have any technical difficulties, please consult the user's manual first at:  
<ftp://ftp.arbor.com.tw/pub/manual>

Please do not hesitate to call or e-mail our customer service when you still can not find out the answer.

<http://www.arbor.com.tw>

E-mail: [info@arbor.com.tw](mailto:info@arbor.com.tw)

#### FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



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## Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:



1 x Em104-i290K-N4

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1 x Driver CD

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1 x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

## Ordering Information

Em104-i290K-N4	Intel® Atom™ N455 PC/104 CPU module
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## Optional Accessories

CBK-11-290K-00	<p>Cable kit</p> <ul style="list-style-type: none"><li>• 1 x SATA cable</li><li>• 1 x SATA Power cable</li><li>• 4 x Serial port cables</li><li>• 1 x KB &amp; MS Y-cable</li><li>• 1 x USB cable</li><li>• 1 x VGA cable</li><li>• 2 x LAN cables</li></ul>
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## Specifications

System	
CPU	Soldered onboard Intel® Atom™ N455 1.66GHz processor
Memory	Soldered onboard 1GB DDR3 SDRAM
Chipset	Intel® ICH8M
BIOS	AMI PnP Flash BIOS
Watchdog Timer	1 ~ 255 levels reset
I/O	
I/O Chipset	Fintek F81866
Serial Port	4 x RS-232/485 selectable ports (RS-485 with auto flow control)
USB Port	2 x USB 2.0 ports
KB/MS	6-pin wafer connector for keyboard and mouse
Expansion Bus	PC/104 interface
Storage	1 x Serial ATA port with 300MB/s HDD transfer rate
	1 x CompactFlash Type II socket
Ethernet Chipset	2 x Intel® 82583V PCIe GbE controllers
Display	
Graphics Chipset	Integrated Intel® Graphics Media Accelerator 3150
Graphics Interface	Analog RGB supports resolution up to 2048 x 1536
	LCD: Single channel 18-bit LVDS
Mechanical & Environmental	
Power Requirement	+5V (Additional +12V might be required for LCD panel)
Power Consumption	2.4A@+5V (Typical)
Operating Temp.	-20 ~ 70°C (-4 ~ 158°F)
Operating Humidity	10%~95% @ 70°C (non-condensing)
Dimension (L x W)	95.89 x 90.17 mm (3.775" x 3.549")

# Find Device Drivers on CD

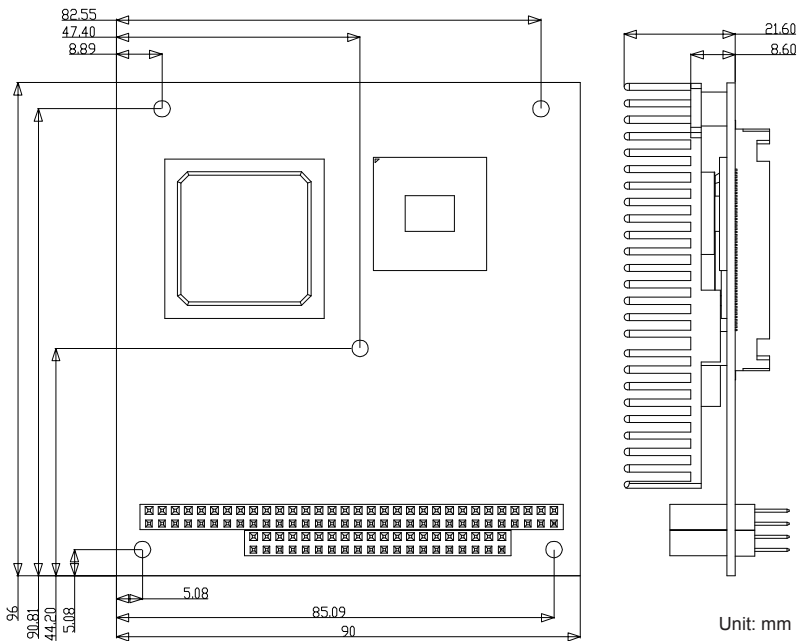
## Windows XP

Device	Driver Path
Chipset	\\Em104-i290K\CHIPSET\Winxp\PVM infinst_autol_9.1.1.1020
VGA	\\Em104-i290K\GRAPHICS\32\Graphics_WinXP_32_V6.14.10.5182 \\Em104-i290K\GRAPHICS\64
LAN	\\Em104-i290K\ETHERNET\32 \\Em104-i290K\ETHERNET\64
AHCI	\\Em104-i290K\AHCI

## Windows 7

Device	Driver Path
Chipset	\\Em104-i290K\CHIPSET\Win7\INF 9.1
VGA	\\Em104-i290K\GRAPHICS\32 \\Em104-i290K\GRAPHICS\64
LAN	\\Em104-i290K\ETHERNET\32 \\Em104-i290K\ETHERNET\64

## Board Dimensions



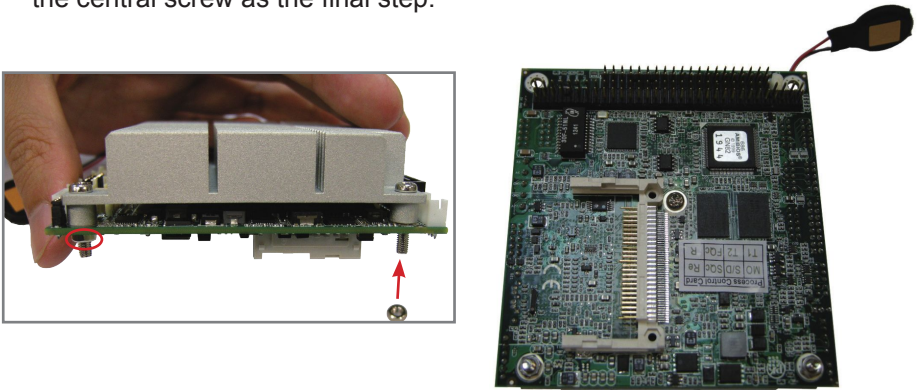
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## The Installation of Heatsink

1. Prepare the heatsink included in standard accessory kit. Mount it on the CPU module as below. Insert screws into screw holes at corners.



2. Secure nuts from another side to fix screws. Overturn the card and tighten the central screw as the final step.



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## Jumpers & Connectors Quick Reference

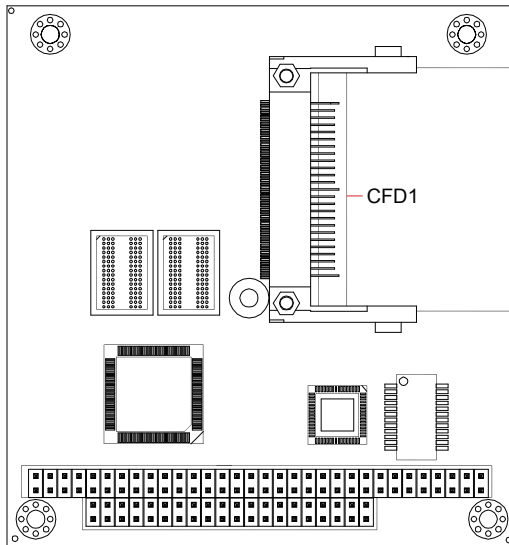
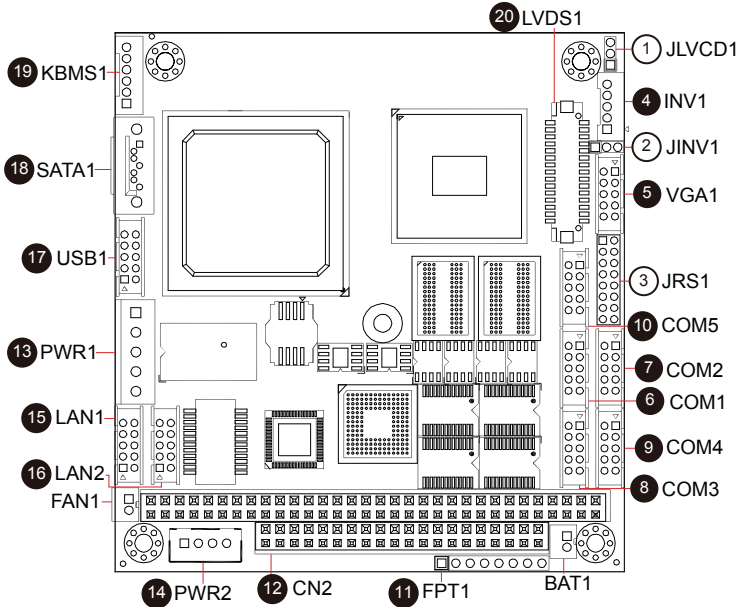
### Jumpers

Label	Function
JLVCD1	LCD Panel Voltage Selection
JINV1	LCD Inverter Voltage Selection
JRS1	COM1~4 RS-232 or RS-485 Settings

### Connectors

Label	Function
INV1	Inverter Power Output
VGA1	Analog RGB Display Connector
COM1~4	RS-232 or RS-485 Serial Ports
COM5	RS-485 Serial Port
BAT1	Battery Connector
FPT1	Reset/Power LED/HDD LED/Speaker
CN2	PC/104 Connector
PWR1	12V/5V Power Input
PWR2	5V Power Output
FAN1	CPU Fan Power
LAN1~2	Ethernet Connectors
USB1	USB 0, 1 Connector
SATA1	Serial ATA Connector
KBMS1	PS/2 interface Keyboard and Mouse Connector
LVDS1	LVDS Panel Connector
CFD1	Compact Flash Connector

# Jumpers & Connectors Location





## Jumpers

### JLVCD1: LCD Panel Voltage Selection (1)

Connector type: 2.00mm pitch, 1x3-pin header  
The voltage of LCD panel is selected by JLVCD1.



Pin	Description
1-2	+5V
2-3	+3.3V (default)

### JINV1: LCD Inverter Voltage Selection (2)

Connector type: 2.00mm pitch, 1x3-pin header  
The voltage of INV1 is selected by JINV1; that is to say, INV1's pin1 is defined by JINV1.

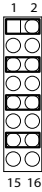
Pin	Description
1-2	+12V
2-3	+5V (default)

### JRS1: COM1~4 RS-232 or RS-485 Settings (3)

Connector type: 2.00mm pitch, 2x8-pin header

Pin	Description
1-2	COM1 RS-232 (default)
3-4	COM1 RS-485*
5-6	COM2 RS-232 (default)
7-8	COM2 RS-485*
9-10	COM3 RS-232 (default)
11-12	COM3 RS-485*
13-14	COM4 RS-232 (default)
15-16	COM4 RS-485*




\*Note: Except proper jumper setting, serial Port1 RS485~Serial Port4 RS485 items in BIOS (under Configure F81866D Super IO Chipset page) should be set to Enabled mode to use RS-485 function.

## Connectors

### INV1: LCD Inverter Connector (4)

Connector type: 2.00mm pitch 1x5-pin box wafer connector

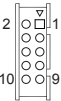
Pin	Description
1	Vin
2	GND
3	on/off
4	Brightness control
5	GND



### VGA1: Analog RGB Output Connector (5)

Connector type: 2.00mm pitch 2x5-pin headers

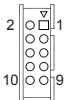
Pin	Description	Pin	Description
2	GND	1	CRT_RED
4	GND	3	CRT_GREEN
6	GND	5	CRT_BLUE
8	VGA_HSYNC	7	VGA_DDC_DATA
10	VGA_VSYNC	9	VGA_DDC_CLK



### COM1~4: RS-232 or RS-485 Serial Ports (6~9)

Connector type: 2.00mm pitch 2x5-pin header

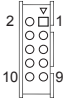
Pin	Desc.	Pin	Desc.
2	RX	1	DCD#
4	DTR#	3	TX#
6	DSR#	5	GND
8	CTS#	7	RTS#
10	N/C	9	RI#



### COM5: RS-485 Serial Port (10)

Connector type: 2.00mm pitch 2x5-pin header


Pin	Desc.	Pin	Desc.
2	+DATA1	1	-DATA1
4	+DATA2	3	-DATA2
6	-DATA3	5	GND
8	-DATA4	7	+DATA3
10	N/C	9	+DATA4



### FPT1: Reset/Power LED/HDD LED/Speaker Connector (11)

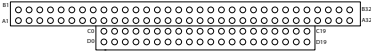
Connector type: 2.00mm pitch 1x8-pin header

Pin	Description
1	RESET
2	GND
3	PWR LED+
4	GND
5	HDD LED+
6	HDD LED-
7	SPKOUT+
8	SPKOUT-





## CN2: PC/104 Interface (12)



## PWR1: 12V/5V Power Input (13)

Connector type: 1x5-pin terminal

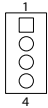
Pin	Description
1	VCC 12V
2	GND
3	GND
4	VCC 5V
5	VCC 5V



## PWR2: 5V Power Output (14)

Connector type: 2.54mm pitch 1x4-pin box wafer connector

Pin	Description
1	VCC 5V
2	GND
3	GND
4	VCC 12V(From Pin1 of PWR1)



## LAN1~2: Ethernet Connectors (15~16)

Connector type: 2.00mm pitch 2x5-pin headers.

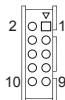
Pin	Desc.	Pin	Desc.
2	TX_MDI0-	1	TX_MDI0+
4	MDI2+	3	RX_MDI1+
6	RX_MDI1-	5	MDI2-
8	MDI3-	7	MDI3+
10	N/C	9	N/C



## USB1: USB 0, 1 Connector (17)

Connector type: 2.00mm pitch 2x5-pin header

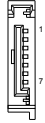
Pin	Desc.	Pin	Desc.
2	+5V-	1	+5V
4	USBP1-	3	USBP0-
6	USBP1+	5	USBP0+
8	GND	7	GND
10	N/C	9	GND



## SATA1: Serial ATA Connector (18)

High speed transfer rates (300MB/s).

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



## KBMS1: Keyboard & Mouse Connector (19)

Connector type: 2.0mm pitch 1x6-pin header

Pin	Description
1	KB_DATA
2	GND
3	MS_DATA
4	KB_CLK
5	PS2_VCC
6	MS_CLK



## LVDS1: LVDS Panel Connector (20)

Connector type: DF-13-30DP-1.25V connector

Pin	Description	Pin	Description
2	VDD	1	VDD
4	N/C	3	TX1CLK+
6	N/C	5	TX1CLK-
8	GND	7	GND
10	N/C	9	TX1D0+
12	N/C	11	TX1D0-
14	GND	13	GND
16	N/C	15	TX1D1+
18	N/C	17	TX1D1-
20	GND	19	GND
22	N/C	21	TX1D2+
24	N/C	23	TX1D2-
26	GND	25	GND
28	N/C	27	N/C
30	N/C	29	N/C

