

COM-LN

Intel® Atom™ N450/D410/D510 Processor

Two DDRII SODIMM

High Definition Audio Interface

1 PATA/ 3 SATA II/ 8 USB2.0

4 PCI/ 5 PCI-Express[x1]

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Packing List

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

- 4 M2.5 screws
- 1 COM-LN CPU Module
- 1 CD-ROM for manual (in PDF format) and drivers

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

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Chapter

1

**General
Information**

1.1 Introduction

AAEON announces a brand new COM Express CPU module that adopts the Intel® Atom™ processor D510, the first dual-core CPU in the Intel Atom processor family supported for embedded applications. With the increasing demand for smaller, lower-power, yet higher-performance embedded solutions, the COM-LN brings the state-of-the-art technology of the Intel® Atom™ processor to the embedded world.

The Intel® Atom™ processor D510 supports Intel® Hyper-Threading Technology and features an integrated graphics controller (GMA 3150) along with a built-in memory controller reducing the chipset footprint. COM-LN utilizes the Intel® 82801HM I/O Controller (ICH8M) to create a feature-rich platform and the Intel® 82567V Gigabit Ethernet Controller for Gigabit Ethernet connection. One parallel IDE and three SATA II interfaces allow flexible storage options. Five PCI-Express[x1] lanes, optional six PCI-Express[x1] lanes, four 32-bit PCI, as well as LPC, SMBus and I2C provide versatile expansion interfaces. This multitude of expansion interfaces allows system integrators to easily expand their embedded systems.

1.2 Features

- Onboard Intel® Atom™ N450/ D410/ D510 Processor
- Intel® ICH8M
- SODIMM DDRII 533/667/800 Memory, Max. 4 GB
- Gigabit Ethernet
- CRT, 18-bit Single-channel LVDS LCD
- High Definition Audio Interface
- PATA x 1, SATA II x 3
- USB2.0 x 8
- PCI x 4, PCI-Express[x1] x 5 (x 6: Optional)
- Wide DC Input Range, +8.5V To +19V (Optional)
- COM Express Pin-out Type II
- Compact Module Size, 95mm x 95mm

1.3 Specifications

System

- CPU Onboard Intel® Atom™ N450/D410/D510 Processor, 1.66 GHz
- System Memory 200-pin DRII SODIMM x 2, TF-COM-LN-A10: Max. 2 GB (DDRII 533/667); TF-COM-LN-A10-01/02: Max. 4 GB (DDRII 667/800)
- I/O Chipset ICH8M
- Ethernet Intel® 82567V, 10/100/1000Base-TX
- BIOS AMI BIOS, SPI type, 4MB ROM
- EEPROM Atmel AT24C02, save BIOS and configuration data (Optional)
- Wake on LAN Yes
- Watchdog Timer Fintek F75111
- H/W status monitoring Supports CPU temperature monitoring
- Expansion Interface PCI-Express [x1] x 5 (x 6: Optional, GbE on the module: Disabled); 32-bit PCI x 4

- Power Requirement
LPC bus x 1
SMBus x 1
I2C x 1
Wide DC input range, +8.5V to +19V (Optional),
Nominal: +12V
2-pin wafer for RTC battery
- Board Size
3.74”(L) x 3.74” (W)
(95mm x 95mm)
- Gross Weight
0.55 lb (0.25 kg)
- Operating Temperature
32°F~140°F (0°C~60°C)
- Storage Temperature
-40°F~176°F (-40°C~80°C)
- Operating Humidity
0%~90% relative humidity,
non-condensing

Display: supports CRT/LCD simultaneous/dual view displays

- Chipset
Intel® N450/D410/D510
Integrated; integrated hardware
MPEG2 decoder
- Memory
Shared system memory up to
384 MB/ DVMT 4.0
- Resolution
Up to 2048x1536 (QXGA) @
60 Hz for CRT (D410/D510);
Up to 1400x1050 (SXGA) @ 60
Hz for CRT (N450);

Up to 1366x768 or 1280x800
(WXGA) for LCD

- LCD Interface 18-bit single channel LVDS

I/O

- Storage PATA x 1 (Two devices);
SATA II x 3
- USB USB2.0 x 8
- Audio High definition audio
- GPIO Up to 4 in or 4 out

Chapter

2

**Quick
Installation
Guide**

Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.



2.1 Safety Precautions

Warning!

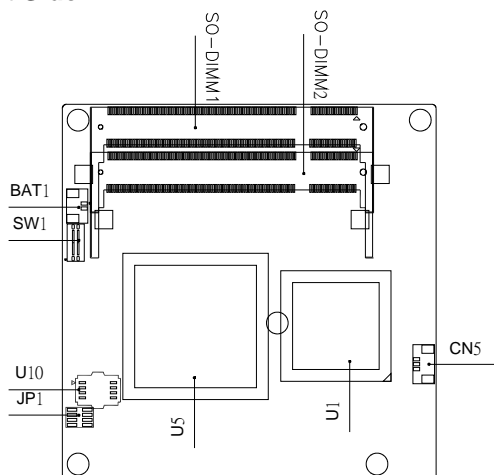
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

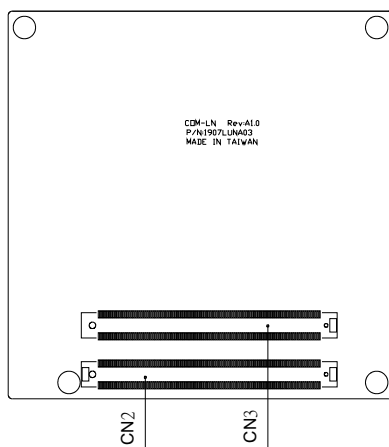
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Switch

Component Side

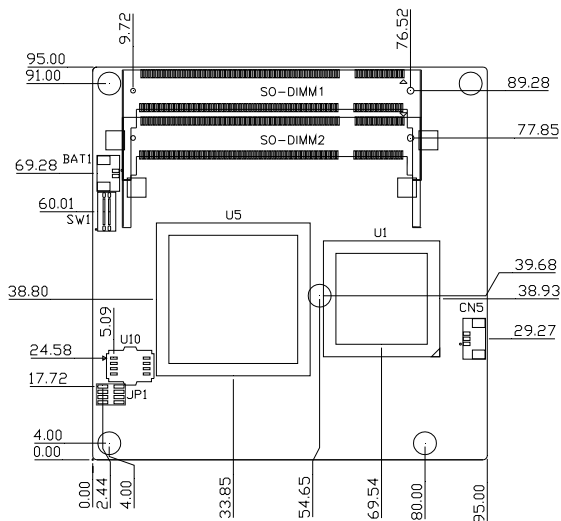


Solder Side

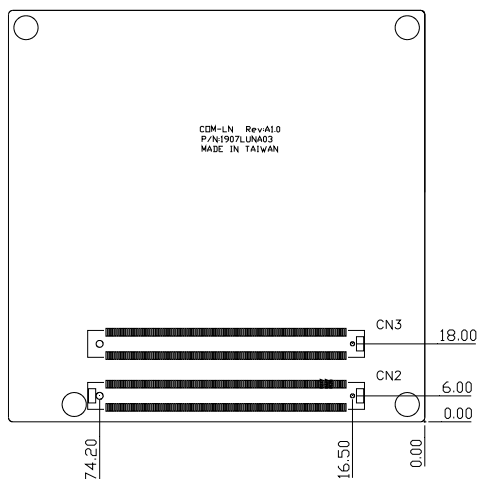


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Switch

There is a switch on the board that allows you to configure your system to suit your application. The table below shows the function of the switch.

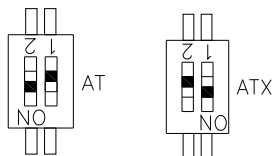
Label	Function
SW1	AT/ATX Selection

2.5 List of Connectors

There are a number of connectors of the board that allow you to configure your system to suit your application. The table below shows the function of each connector in the board:

Label	Function
CN2	COM Express ROW A/B Connector
CN3	COM Express ROW C/D Connector
CN5	Fan Connector
JP1	SPI Flash Programming Connector
BAT1	Battery Connector
U10	SPI BIOS Socket

2.6 AT/ATX Selection (SW1)



Label	Function
1 (On), 2 (Off)	ATX (Default)
1 (Off), 2 (On)	AT

2.7 COM Express Connector (Row A & B) (CN2)

Row A		Row B	
A1	GND (FIXED)	B1	GND (FIXED)
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK	B8	LPC_DRQ0#
A9	GBE0_MDI1-	B9	LPC_DRQ1#
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND (FIXED)	B11	GND (FIXED)
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	GBE0_CTREF	B14	SMB_DAT

A15	SUS_S3#	B15	SMB_ALERT#
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND (FIXED)	B21	GND (FIXED)
A22	SATA2_TX+	B22	N.C.
A23	SATA2_TX-	B23	N.C.
A24	SUS_S5#	B24	PWR_OK
A25	SATA2_RX+	B25	N.C.
A26	SATA2_RX-	B26	N.C.
A27	BATLOW#	B27	WDT
A28	ATA_ACT#	B28	AC_SDIN2
A29	AC_SYNC	B29	AC_SDIN1
A30	AC_RST#	B30	AC_SDIN0
A31	GND (FIXED)	B31	GND (FIXED)
A32	AC_BITCLK	B32	SPKR
A33	AC_SDOUT	B33	I2C_CK
A34	BIOS_DISABLE#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	USB6-	B36	USB7-
A37	USB6+	B37	USB7+
A38	USB_6_7_OC#	B38	USB_4_5_OC#

A39	USB4-	B39	USB5-
A40	USB4+	B40	USB5+
A41	GND (FIXED)	B41	GND (FIXED)
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	EXCD1_PERST#
A48	EXCD0_PERST#	B48	EXCD1_CPPE#
A49	EXCD0_CPPE#	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND (FIXED)	B51	GND (FIXED)
A52	N.C.	B52	N.C.
A53	N.C.	B53	N.C.
A54	GPIO	B54	GPO1
A55	PCIE_TX4+	B55	PCIE_RX4+
A56	PCIE_TX4-	B56	PCIE_RX4-
A57	GND	B57	GPO2
A58	PCIE_TX3+	B58	PCIE_RX3+
A59	PCIE_TX3-	B59	PCIE_RX3-
A60	GND (FIXED)	B60	GND (FIXED)
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-

A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND	B66	WAKE0#
A67	GPI2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND (FIXED)	B70	GND (FIXED)
A71	LVDS_A0+	B71	N.C.
A72	LVDS_A0-	B72	N.C.
A73	LVDS_A1+	B73	N.C.
A74	LVDS_A1-	B74	N.C.
A75	LVDS_A2+	B75	N.C.
A76	LVDS_A2-	B76	N.C.
A77	LVDS_VDD_EN	B77	N.C.
A78	N.C.	B78	N.C.
A79	N.C.	B79	LVDS_BKLT_EN
A80	GND (FIXED)	B80	GND (FIXED)
A81	LVDS_A_CK+	B81	N.C.
A82	LVDS_A_CK-	B82	N.C.
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A84	LVDS_I2C_DAT	B84	VCC_5V_SBY
A85	GPI3	B85	VCC_5V_SBY
A86	KBD_RST#	B86	VCC_5V_SBY

A87	KBD_A20GATE	B87	VCC_5V_SBY
A88	PCIE0_CK_REF+	B88	RSVD
A89	PCIE0_CK_REF-	B89	VGA_RED
A90	GND (FIXED)	B90	GND (FIXED)
A91	RSVD B91	B91	VGA_GRN
A92	RSVD	B92	VGA_BLU
A93	GPO0	B93	VGA_HSYNC
A94	RSVD	B94	VGA_VSYNC
A95	RSVD	B95	VGA_I2C_CK
A96	GND	B96	VGA_I2C_DAT
A97	VCC_12V	B97	N.C.
A98	VCC_12V	B98	N.C.
A99	VCC_12V	B99	N.C.
A100	GND (FIXED)	B100	GND (FIXED)
A101	VCC_12V	B101	VCC_12V
A102	VCC_12V	B102	VCC_12V
A103	VCC_12V	B103	VCC_12V
A104	VCC_12V	B104	VCC_12V
A105	VCC_12V	B105	VCC_12V
A106	VCC_12V	B106	VCC_12V
A107	VCC_12V	B107	VCC_12V
A108	VCC_12V	B108	VCC_12V
A109	VCC_12V	B109	VCC_12V
A110	GND (FIXED)	B110	GND (FIXED)

2.8 COM Express Connector (Row C & D) (CN3)

Row C		Row D	
C1	GND (FIXED)	D1	GND (FIXED)
C2	IDE_D7	D2	IDE_D5
C3	IDE_D6	D3	IDE_D10
C4	IDE_D3	D4	IDE_D11
C5	IDE_D15	D5	IDE_D12
C6	IDE_D8	D6	IDE_D4
C7	IDE_D9	D7	IDE_D0
C8	IDE_D2	D8	IDE_REQ
C9	IDE_D13	D9	IDE_IOW#
C10	IDE_D1	D10	IDE_ACK#
C11	GND (FIXED)	D11	GND (FIXED)
C12	IDE_D14	D12	IDE_IRQ
C13	IDE_IORDY	D13	IDE_A0
C14	IDE_IOR#	D14	IDE_A1
C15	PCI_PME#	D15	IDE_A2
C16	PCI_GNT2#	D16	IDE_CS1#
C17	PCI_REQ2#	D17	IDE_CS3#
C18	PCI_GNT1#	D18	IDE_RESET#
C19	PCI_REQ1#	D19	PCI_GNT3#
C20	PCI_GNT0#	D20	PCI_REQ3#
C21	GND (FIXED)	D21	GND (FIXED)
C22	PCI_REQ0#	D22	PCI_AD1

C23	PCI_RESET#	D23	PCI_AD3
C24	PCI_AD0	D24	PCI_AD5
C25	PCI_AD2	D25	PCI_AD7
C26	PCI_AD4	D26	PCI_C/BE0#
C27	PCI_AD6	D27	PCI_AD9
C28	PCI_AD8	D28	PCI_AD11
C29	PCI_AD10	D29	PCI_AD13
C30	PCI_AD12	D30	PCI_AD15
C31	GND (FIXED)	D31	GND (FIXED)
C32	PCI_AD14	D32	PCI_PAR
C33	PCI_C/BE1#	D33	PCI_SERR#
C34	PCI_PERR#	D34	PCI_STOP#
C35	PCI_LOCK#	D35	PCI_TRDY#
C36	PCI_DEVSEL#	D36	PCI_FRAME#
C37	PCI_IRDY#	D37	PCI_AD16
C38	PCI_C/BE2#	D38	PCI_AD18
C39	PCI_AD17	D39	PCI_AD20
C40	PCI_AD19	D40	PCI_AD22
C41	GND (FIXED)	D41	GND (FIXED)
C42	PCI_AD21	D42	PCI_AD24
C43	PCI_AD23	D43	PCI_AD26
C44	PCI_C/BE3#	D44	PCI_AD28
C45	PCI_AD25	D45	PCI_AD30
C46	PCI_AD27	D46	PCI_IRQC#

C47	PCI_AD29	D47	PCI_IRQD#
C48	PCI_AD31	D48	PCI_CLKRUN#
C49	PCI_IRQA#	D49	N.C.
C50	PCI_IRQB#	D50	PCI_CLK
C51	GND (FIXED)	D51	GND (FIXED)
C52	N.C.	D52	N.C.
C53	N.C.	D53	N.C.
C54	TYPE0#	D54	N.C.
C55	N.C.	D55	N.C.
C56	N.C.	D56	N.C.
C57	TYPE1#	D57	TYPE2#
C58	N.C.	D58	N.C.
C59	N.C.	D59	N.C.
C60	GND (FIXED)	D60	GND (FIXED)
C61	N.C.	D61	N.C.
C62	N.C.	D62	N.C.
C63	RSVD	D63	RSVD
C64	RSVD	D64	RSVD
C65	N.C.	D65	N.C.
C66	N.C.	D66	N.C.
C67	RSVD	D67	GND
C68	N.C.	D68	N.C.
C69	N.C.	D69	N.C.
C70	GND (FIXED)	D70	GND (FIXED)

C71	N.C.	D71	N.C.
C72	N.C.	D72	N.C.
C73	N.C.	D73	N.C.
C74	N.C.	D74	N.C.
C75	N.C.	D75	N.C.
C76	GND	D76	GND
C77	RSVD	D77	IDE_CBLID#
C78	N.C.	D78	N.C.
C79	N.C.	D79	N.C.
C80	GND (FIXED)	D80	GND (FIXED)
C81	N.C.	D81	N.C.
C82	N.C.	D82	N.C.
C83	RSVD	D83	RSVD
C84	GND	D84	GND
C85	N.C.	D85	N.C.
C86	N.C.	D86	N.C.
C87	GND	D87	GND
C88	N.C.	D88	N.C.
C89	N.C.	D89	N.C.
C90	GND (FIXED)	D90	GND (FIXED)
C91	N.C.	D91	N.C.
C92	N.C.	D92	N.C.
C93	GND	D93	GND
C94	N.C.	D94	N.C.

C95	N.C.	D95	N.C.
C96	GND	D96	GND
C97	RSVD	D97	N.C.
C98	N.C.	D98	N.C.
C99	N.C.	D99	N.C.
C100	GND (FIXED)	D100	GND (FIXED)
C101	N.C.	D101	N.C.
C102	N.C.	D102	N.C.
C103	GND	D103	GND
C104	VCC_12V	D104	VCC_12V
C105	VCC_12V	D105	VCC_12V
C106	VCC_12V	D106	VCC_12V
C107	VCC_12V	D107	VCC_12V
C108	VCC_12V	D108	VCC_12V
C109	VCC_12V	D109	VCC_12V
C110	GND (FIXED)	D110	GND (FIXED)

2.9 FAN Connector (CN5)

Pin	Signal
1	FAN_TACH
2	+5V
3	FAN_PWM

2.10 SPI Flash Programming Connector (JP1)

Pin	Signal	Pin	Signal
1	+3.3V	2	GND
3	SPI_CS#0	4	SPI_CLK
5	SPI_SO	6	SPI_SI
7	N.C	8	N.C

2.11 Battery Connector (BAT1)

Pin	Signal
1	+3V_BAT
2	GND

2.12 SPI BIOS Socket (U10)

Pin	Signal	Pin	Signal
1	SPI_CS#0	5	+3.3V
2	SPI_MISO	6	HOLD#
3	SPI_WP#	7	SPI_CLK
4	GND	8	SPI_MOSI

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

Chapter

3

**AMI
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The COM-LN CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable/disable boot option for legacy network devices.

Chipset

host bridge parameters.

Boot

Enables/disables quiet boot option.

Security

Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Chapter

4

Driver Installation

The COM-LN comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

If the OS system is Windows XP, please follow the sequence below to install the drivers. If the OS system is Linux, please select the folder of **Linux**.

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

Step 5 – Install Touch Panel Driver

USB 2.0 Drivers are available for download using Windows® Update for both Windows® XP and Windows® 2000. For additional information regarding USB 2.0 support in Windows® XP and Windows® 2000, please visit www.microsoft.com/hwdev/usb/.

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the COM-LN CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Chipset Driver

1. Click on the **Step 1 – Chipset** folder and double click on the ***infinst_autol.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the **Step 2 – VGA** folder and double click on the ***Setup.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 3 – Install LAN Driver

1. Click on the **Step 3 – LAN** folder and double click on the ***.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 4 – Install Audio Driver

1. Click on the **Step 4 – Audio** folder and double click on the ***Setup.exe*** file

2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 5 – Install Touch Panel Driver

1. Click on the **Step 5 – Touch Panel** folder and double click on the **Setup.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Appendix

A

Programming the Watchdog Timer

A.1 General Information

The COM-LN utilizes Fintek F75111 chipset as its watchdog timer Controller.

The other Watchdog timer is set to second or minute and the range is 0 to 256 seconds or minutes.

When the timeout has occurred, that will generate a status bit to indicate it and write one will be clear.

A.2 Access Interface

The F75111 provides one serial access interface, I2C Bus, to read/write internal registers. The address of Serial Bus is configurable by using power-on trapping of standby power VBS3V. The pin 3 (GPIO13/I2C _ADDR) is multi-function pin. During the VSB3V power-on, this pin serves as input detection of logic high or logic low. This pin is default pull-down resistor with 100K ohms mapping the Serial Bus address 0x9C (1001_1100). Another Serial Bus address 0x6E (0110_1110) is set when external pull-up resistor with 10K ohms is connected in this pin.

A.3 Registers Description

Configuration and function select Register – Index 03h

Power-on default [7:0] =0000_1000b

Bit	Name	R/W	PWR	Description
7	Reserved	R/W	VSB3V	
6	IRQ_LEVEL	R/W	VSB3V	Select IRQ Polarity (Level). Set to 1, IRQ is low active and SMI# is high active. Default, the IRQ is high active and SMI# is low active.
5	IRQ_MODE	R/W	VSB3V	IRQ/SMI# mode select. 0-Level mode (IRQ mode), 1-Pulse Mode (SMI# mode). If pulse mode is selected, the active pulse is over 100us.
4-3	PIN12_MODE	R/W	VSB3V	00: GPIO12 01: LED12 IN this mode can use REG 0x06(bit5,4) to select LED frequency. 10: IRQ 11: WDTOUT11#
2	PIN11_MODE	R/W	VSB3V	0: GPIO11 1: LED11 IN this mode can use REG 0x06(bit3,2) to select LED frequency.
1-0	PIN10_MODE	R/W	VSB3V	00: GPIO10 01: LED10 IN this mode can use REG 0x06(bit1,0) to select LED frequency. 10,11: WD_OUT

Watchdog Timer Control Register – Index 36h

Power-on default [7:0] =0000_0000b

Bit	Name	R/W	PWR	Description
7	Reserved	RO	VSB3V	Reserved. Read will return 0.
6	STS_WD_TMOUT	R/W	VSB3V	Watchdog is timeout. When the watchdog is timeout, this bit will be set to one. If set to 1, write 1 will clear this bit. Write 0, no effect.

5	WD_ENABLE	R/W	VSB3V	Enable watchdog timer.
4	WD_PULSE	R/W	VSB3V	Watchdog output level or pulse. If set 0 (default), the pin of watchdog is level output. If write 1, the pin will output with a pulse.
3	WD_UNIT	R/W	VSB3V	Watchdog unit select. Default 0 is select second. Write 1 to select minute.
2	WD_HACTIVE	R/W	VSB3V	Program WD2 output level. If set to 1 and watchdog asserted, the pin will be high. If set to 0 and watchdog asserted, this pin will drive low (default).
1-0	WD_PSWIDTH			Watchdog pulse width selection. If the pin output is selected to pulse mode. This pulse width can be chosen. 00b-1m second. 01b-20m second. 10b-100m second. 11b- 4 second.

Watchdog Timer Range Register – Index 37h

Power-on default [7:0] =0000_0000b

Bit	Name	R/W	PWR	Description
7-0	WD_TIME	R/W	VSB3V	Watchdog timing range from 0~255. This unit is either second or minute programmed by the watchdog timer control register bit3.

A.4 F75111 Watchdog Timer Initial Program

```
#include <stdio.h>
#include <conio.h>

void Chk_Ready();

#define SMBus_Port    0x500
#define I2C_Addr     0x6E

void main (void)
{
//device ID(smbus):6Eh,index:3h data:3h      //Set pin10 as WDTOUT2#
    outportb(SMBus_Port+0x04,I2C_Addr);
    delay(10);
    Chk_Ready();
    outportb(SMBus_Port+0x03,0x3);
    delay(10);
    outportb(SMBus_Port+0x05,0x3);
    delay(10);
    outportb(SMBus_Port+0x02,0x48);
    delay(10);
    Chk_Ready();
//device ID(smbus):6Eh,index:37h data:05h   //Set Watchdog Timer Rang
register to //be 5
```

```
    outputb(SMBus_Port+0x04,I2C_Addr);
delay(10);
    Chk_Ready();
outputb(SMBus_Port+0x03,0x37);
delay(10);
outputb(SMBus_Port+0x05,0x05);
delay(10);
outputb(SMBus_Port+0x02,0x48);
delay(10);
    Chk_Ready();
//device ID(smbus):6Eh,index:36h data:30h    //Enable Watchdog Timer 2 and
output //a pulse when timeout.
    outputb(SMBus_Port+0x04,I2C_Addr);
delay(10);
        Chk_Ready();
        outputb(SMBus_Port+0x03,0x36);
        delay(10);
        outputb(SMBus_Port+0x05,0x30);
        delay(10);
        outputb(SMBus_Port+0x02,0x48);
        delay(10);
        Chk_Ready();
}

void Chk_Ready()
```

```
{  
  
    int inputbuffer;  
    int index;  
    index=0;  
    while(index<0x800)  
    {  
        inputbuffer=inportb(SMBus_Port);  
        delay(10);  
        outportb(SMBus_Port,0x42);  
        delay(10);  
  
        if((inputbuffer&0x02)!=0)  
            return;  
        if((inputbuffer&(0xbf))==0)  
            return;  
        if((inputbuffer&0x04)==0)  
            return;  
        index++;  
    }  
    printf("\nDevice not ready!\n");  
    outportb(SMBus_Port,0xFF);  
    exit(0);  
}
```

Appendix

B

I/O Information

B.1 I/O Address Map

Input/output (IO)	
[00000000 - 0000000F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000060 - 00000060]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061]	System speaker
[00000062 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 0000006F]	Motherboard resources
[00000070 - 00000071]	System CMOS/real time clock
[00000072 - 0000007F]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000081 - 00000083]	Direct memory access controller
[00000084 - 00000086]	Motherboard resources
[00000087 - 00000087]	Direct memory access controller
[00000088 - 00000088]	Motherboard resources
[00000089 - 0000008B]	Direct memory access controller
[0000008C - 0000008E]	Motherboard resources
[0000008F - 0000008F]	Direct memory access controller
[00000090 - 0000009F]	Motherboard resources
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000C0 - 000000DF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor
[00000170 - 00000177]	Secondary IDE Channel
[000001F0 - 000001F7]	Primary IDE Channel
[00000274 - 00000277]	ISAPNP Read Data Port
[00000279 - 00000279]	ISAPNP Read Data Port
[00000290 - 0000029F]	Motherboard resources
[000002F8 - 000002FF]	Communications Port (COM2)
[00000376 - 00000376]	Secondary IDE Channel
[00000378 - 0000037F]	Printer Port (LPT1)
[000003B0 - 000003BB]	Intel(R) Graphics Media Accelerator 3150
[000003C0 - 000003DF]	Intel(R) Graphics Media Accelerator 3150
[000003F6 - 000003F6]	Primary IDE Channel
[000003F8 - 000003FF]	Communications Port (COM1)
[00000480 - 000004BF]	Motherboard resources
[000004D0 - 000004D1]	Motherboard resources
[00000778 - 0000077F]	Motherboard resources
[00000800 - 0000087F]	Motherboard resources
[00000A79 - 00000A79]	ISAPNP Read Data Port
[00000B78 - 00000B7F]	Motherboard resources
[00000D00 - 0000FFFF]	PCI bus

[00000F78 - 00000F7F]	Motherboard resources
[0000E000 - 0000E01F]	Intel(R) PRO/1000 PL Network Connection
[0000E000 - 0000EFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[0000F000 - 0000F01F]	Intel(R) ICH8 Family SMBus Controller - 283E
[0000F020 - 0000F03F]	Intel(R) ICH8 Family USB Universal Host Controller - 2832
[0000F040 - 0000F05F]	Intel(R) ICH8 Family USB Universal Host Controller - 2831
[0000F060 - 0000F07F]	Intel(R) ICH8 Family USB Universal Host Controller - 2830
[0000F080 - 0000F09F]	Intel(R) ICH8 Family USB Universal Host Controller - 2835
[0000F0A0 - 0000F0BF]	Intel(R) ICH8 Family USB Universal Host Controller - 2834
[0000F0C0 - 0000F0DF]	Intel(R) 82567V-3 Gigabit Network Connection
[0000F0E0 - 0000F0EF]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F0F0 - 0000F0FF]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F100 - 0000F103]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F110 - 0000F117]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F120 - 0000F123]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F130 - 0000F137]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F140 - 0000F14F]	Intel(R) ICH8M Ultra ATA Storage Controllers - 2850
[0000F190 - 0000F197]	Intel(R) Graphics Media Accelerator 3150

B.2 Memory Address Map

Memory	
[000A0000 - 000BFFFF]	Intel(R) Graphics Media Accelerator 3150
[000A0000 - 000BFFFF]	PCI bus
[7F700000 - FFFFFFFF]	PCI bus
[E0000000 - EFFFFFFF]	Intel(R) Graphics Media Accelerator 3150
[F0000000 - F3FFFFFF]	System board
[FE800000 - FE8FFFFFF]	Intel(R) Graphics Media Accelerator 3150
[FE900000 - FE91FFFF]	Intel(R) PRO/1000 PL Network Connection
[FE900000 - FE9FFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[FEA00000 - FEA7FFFF]	Intel(R) Graphics Media Accelerator 3150
[FEA80000 - FEAFFFFF]	Intel(R) Graphics Media Accelerator 3150
[FEB00000 - FEB1FFFF]	Intel(R) 82567V-3 Gigabit Network Connection
[FEB20000 - FEB23FFF]	Microsoft UAA Bus Driver for High Definition Audio
[FEB24000 - FEB240FF]	Intel(R) ICH8 Family SMBus Controller - 283E
[FEB25000 - FEB253FF]	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836
[FEB26000 - FEB263FF]	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
[FEB27000 - FEB27FFF]	Intel(R) 82567V-3 Gigabit Network Connection
[FEC00000 - FEC00FFF]	Motherboard resources
[FED00000 - FED003FF]	High precision event timer
[FED14000 - FED19FFF]	System board
[FED1C000 - FED1FFFF]	Motherboard resources
[FED20000 - FED8FFFF]	Motherboard resources
[FEE00000 - FEE00FFF]	Motherboard resources
[FFE00000 - FFFFFFFF]	Motherboard resources

B.3 IRQ Mapping Chart

Interrupt request (IRQ)	
(ISA) 0	High precision event timer
(ISA) 1	Standard 101/102-Key or Microsoft Natural P5/2 Keyboard
(ISA) 3	Communications Port (COM1)
(ISA) 4	Communications Port (COM2)
(ISA) 8	High precision event timer
(ISA) 9	Microsoft ACPI-Compliant System
(ISA) 12	Microsoft P5/2 Mouse
(ISA) 13	Numeric data processor
(ISA) 14	Primary IDE Channel
(ISA) 15	Secondary IDE Channel
(PCI) 11	Intel(R) ICH8 Family SMBus Controller - 283E
(PCI) 16	Intel(R) Graphics Media Accelerator 3150
(PCI) 16	Intel(R) ICH8 Family USB Universal Host Controller - 2834
(PCI) 16	Intel(R) PRO/1000 PL Network Connection
(PCI) 18	Intel(R) ICH8 Family USB Universal Host Controller - 2832
(PCI) 18	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
(PCI) 18	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
(PCI) 19	Intel(R) ICH8 Family USB Universal Host Controller - 2831
(PCI) 21	Intel(R) ICH8 Family USB Universal Host Controller - 2835
(PCI) 21	Microsoft UAA Bus Driver for High Definition Audio
(PCI) 22	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
(PCI) 23	Intel(R) 82567V-3 Gigabit Network Connection
(PCI) 23	Intel(R) ICH8 Family USB Universal Host Controller - 2830
(PCI) 23	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836

B.4 DMA Channel Assignments

Direct memory access (DMA)	
4	Direct memory access controller