LinCon-8000

Compact Embedded Controller

Hardware User's Manual

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Warranty

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

Warning

ICP DAS assumes no liability for damages consequent to the use of this product. ICP DAS reserves the right to change this manual at any time without notice. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, nor for any infringements of patents or other rights of third parties resulting from its use.

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Table of Contents

1. Introduction

1.1 Package List & Release Note

Package List：

In addition to this manual, the package includes the following items:

- One set of LinCon-8000 hardware
- One Compact Flash Memory Card for storing system files
- One hardware user's manual (this manual)
- One release note
- One software utility CD with Software User's Manual included

Note：

If any of these items are missing or damaged, contact the local distributors for more information. Save the shipping materials and cartons in case you want to ship in the future.

Release Note：

It is recommended to read the **release note & README.TXT** first. The release note is included in the shipping products. In addition, the README.TXT can also be located in the CD\README.TXT. Some important information is provided in the release note & CD\README.TXT.

Ordering Information

Call your distributor for details.

1.2   LinCon-8000 Series

The LinCon-8000 is the flagship compact embedded controller manufactured by ICP DAS. Its leading technology gives you all of the best features of both traditional PLCs and Linux capable PCs. The LinCon-8000 system is powered by Linux and brings in the Linux programming style and skill into the world of PC-based PLC. Application developers can develop their own programs directly into C or Java language by using the LinCon-8000 SDK, and then download them into the LinCon-8000 for application and use.
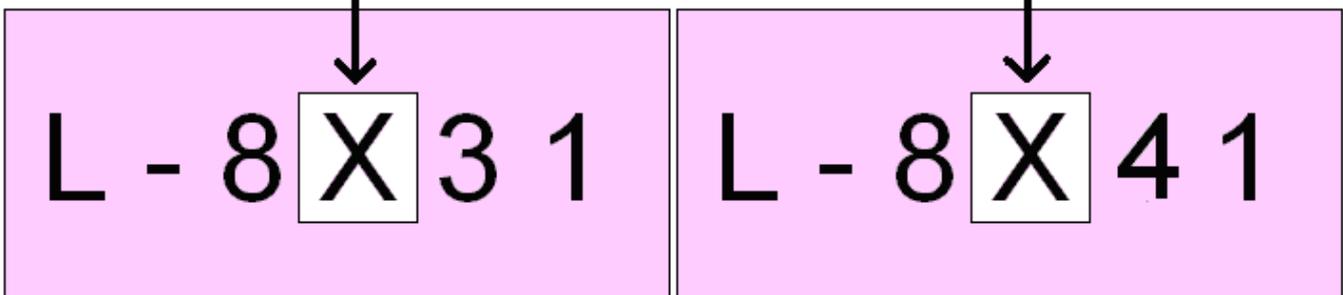
The LinCon-8x3x model type is ruled as L-8x31 and the LinCon-8x4x model type is ruled as L-8x41, as shown in the above figure. The Second number shows the slot numbers coming with the main controller unit. Currently, we provide three types of 0、3 and 7 slots for LinCon-8x3x series and two types of 4 and 7 slots for LinCon-8x4x series. The last number demonstrates the application platform. 1 stands as the Master controller and it means that the user needs to design the

application program by themselves. For more details on the product's specifications, please refer to the following product model table given below.

Model	Description	CPU Speed	Embedded OS	Slot	Flash	SDRAM	Peripherals
L-8031 L-8331 L-8731	Embedded Controller	206MHz	Linux	0 3 7	32 Mbyte	64 Mbyte	10BaseT Ethernet Port×1 VGA Port×1 CF Slot×1 USB×1 PS/2 Keyboard×1 PS/2 Mouse×1 RS-232×1 RS-485×1 FRnet×1(Option)
L-8441 L-8741	Embedded Controller	206MHz	Linux	4 7	32 Mbyte	64 Mbyte	10BaseT Ethernet Port×2 VGA Port×1 CF Slot×1 USB×2 RS-232×1 RS-485×1 FRnet×1(Option)

1.3   Contents of CD and CF memory card

CD :

- **LinCon-8000 SDK**
- **Source code of demo programs**
- **Software User's Manual**

References are given in ReadMe.txt in the CD

CF memory card (default is 1 Gbytes):

- **LinCon-8000 System files**
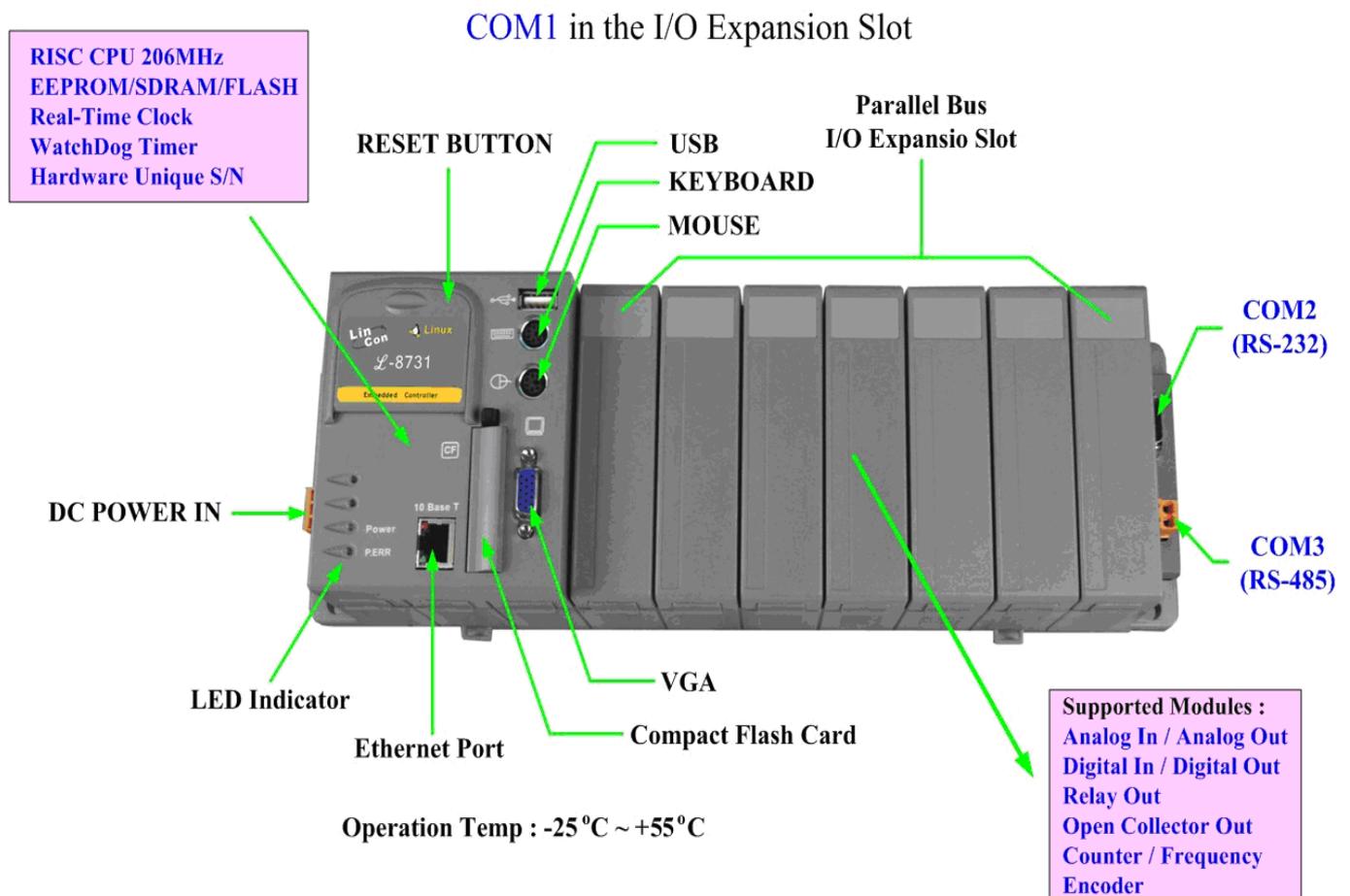- **Demo programs**

References are given in the Software User's Manual bundled CD

2. Hardware Information

The LinCon-8000 Embedded Controller is competitive with Industrial PCs in performance, and is lower in price. The system provides VGA and keyboard/ mouse for local visualization and management. User control programs and data can be saved in persistent storage via Compact Flash and USB interfaces. Furthermore, it has communication capabilities via the built-in Ethernet and RS-232/485 interfaces.
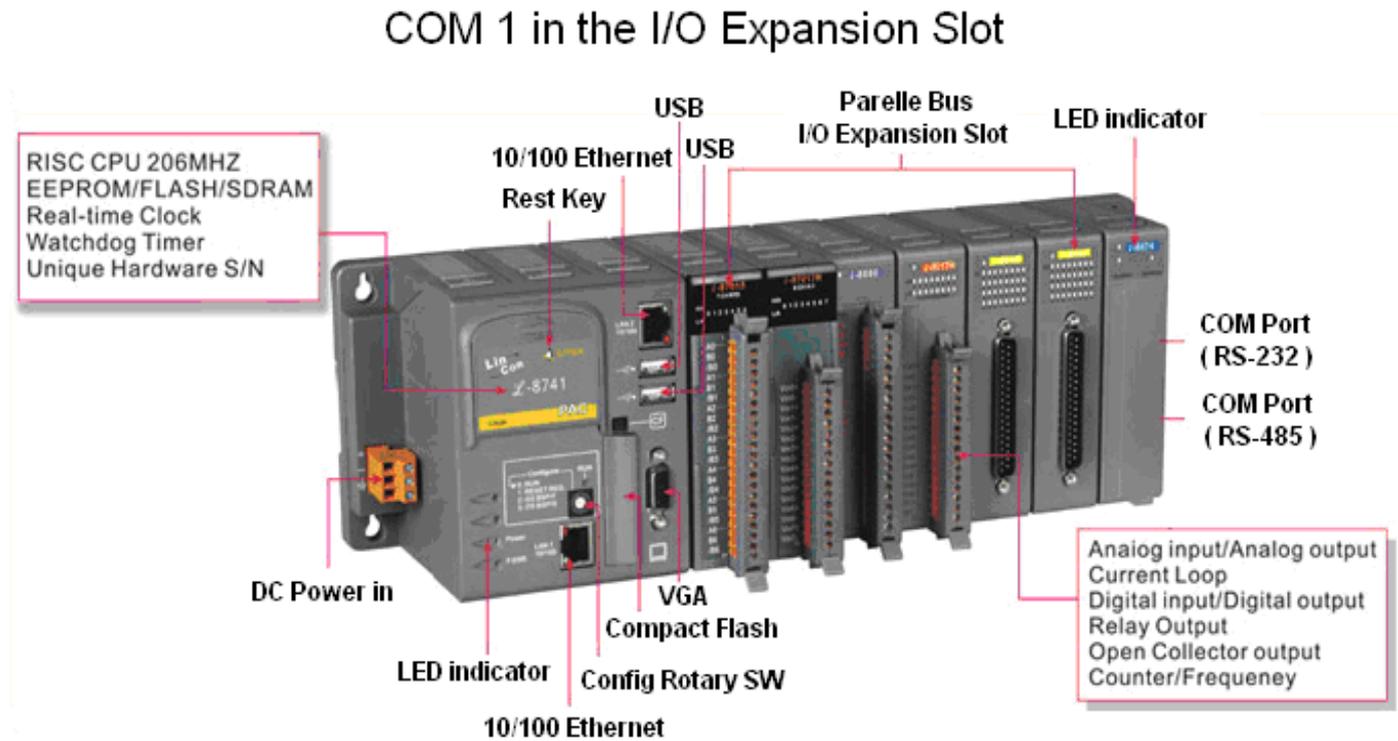
2.1 Front View of the LinCon-8x3x

The following figure demonstrates the hardware system in the LinCon-8x3x. It includes the main controller with HMI, serial communication and I/O expansion interface.

COM1 in the I/O Expansion Slot

RISC CPU 206MHz
EEPROM/SDRAM/FLASH
Real-Time Clock
WatchDog Timer
Hardware Unique S/N

RESET BUTTON

USB
KEYBOARD
MOUSE

Parallel Bus
I/O Expansio Slot

COM2
(RS-232)

DC POWER IN

COM3
(RS-485)

LED Indicator

VGA

Ethernet Port

Compact Flash Card

Supported Modules :
Analog In / Analog Out
Digital In / Digital Out
Relay Out
Open Collector Out
Counter / Frequency
Encoder

Operation Temp : $-25\,^{\circ}C \sim +55\,^{\circ}C$

2.2   Front View of the LinCon-8x4x

The following figure demonstrates the hardware system in the LinCon-8x4x. It includes the main controller with HMI, serial communication and I/O expansion interface.

2.2 Specifications

Main Control Unit	

■ Intel Strong ARM CPU, 206MHz
■ SRAM: 64M bytes
■ Flash Memory: 32M bytes
■ EEPROM: 16K bytes
■ 64-bit hardware unique serial number
■ Built-in Watchdog Timer
■ Real Time Clock
	■ 10 Base T: NE2000 compatible
	■ VGA port:
	    320x240x16 to 1024x768x16
	    Default is 640x480x16
	■ PS/2 port: Keyboard and Mouse
	    (L-8x3x only)
	■ Compact Flash slot: CF memory card
	■ USB 1.1 Host: USB drive or USB mouse
	■ Reset button
	■ Power LEDs

Cabinet	

■ COM0: Internal use
■ COM1: Serial Control for 87K Series
■ COM2: RS-232
■ COM3: RS-485
■ FRnet(Option)
■ I/O Expansion Slot:
    0-slot for L-8031   /   3-slot for L-8331   /   7-slot for L-8741
    4-slot for L-8441 / 7-slot for L-8731	

■ Power Supply: 25W, Unregulated +10Vdc to +30Vdc	

■ Environment:
    Operating Temp: -25°C to +55°C
    Storage Temp: -30°C to +85°C
■ Humidity: 5~95%	

■ Dimensions:
    115x110x75.5mm(0 slot)
    213x110x75.5mm(3 slot)
    418x110x75.5mm(7 slot)	

■ I/O module (optional)
  I-8000 serial modules, which include DI, DO, AO, AI...
  I-87K serial modules, which include DI, DO, AO, AI...
  I-7000 serial modules, which include DI, DO, AO, AI...
  If you want to get more information, welcome to refer to the relative catalog or visit the web site http://www.icpdas.com.	

3. Applications

The following figure diagrams the general application area and structure of the LinCon-8000. COM2 is the standard RS-232 interface, which can be connected via the modem or to the Com1 in the LinCon-8000 Controller. COM3 is the RS-485 interface, which can be applied to control the ICP DAS DCON serial modules such as the I-7000, I-8000 and I-87K. The FRnet system is an optional control interface.
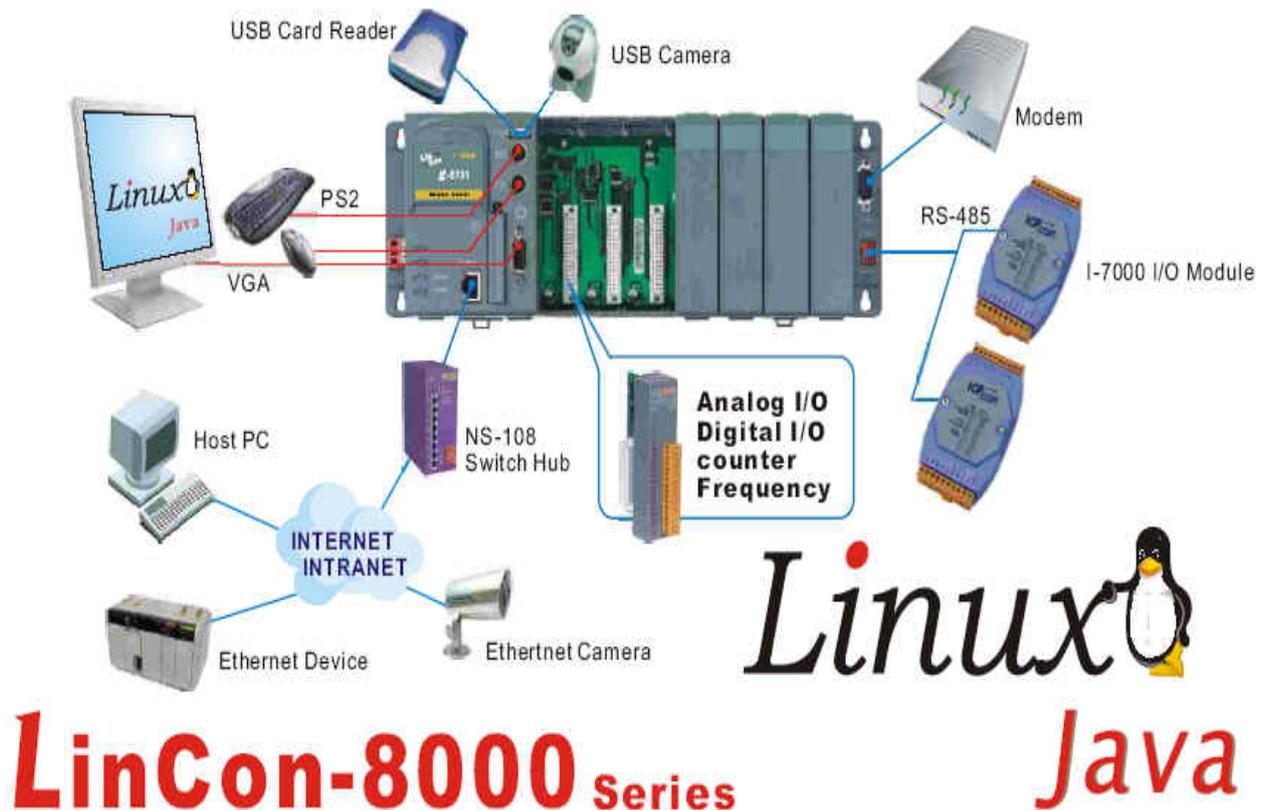
4. Quick Start

Step 1. Plug in your PS/2 or USB keyboard and mouse.

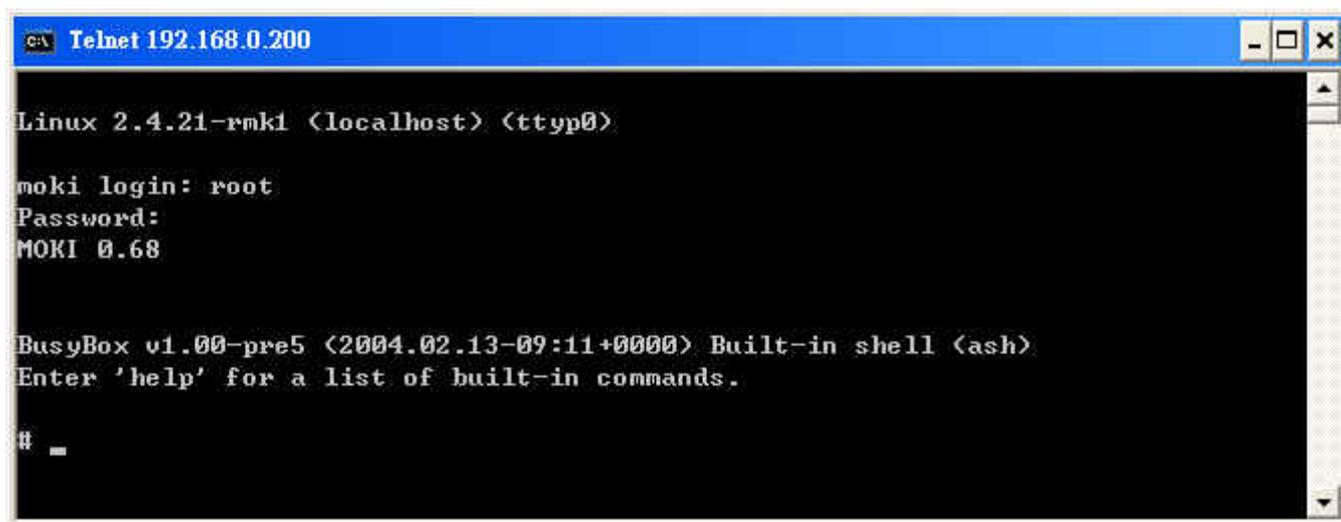**Step 2. Plug in your VGA monitor.**

Step 3. Connect the LinCon-8000 to the LAN.

Step 4. Insert the I-8K/87K series I/O modules into the LinCon-8000 slots.

Step 5. Connect the COM2 or the COM3 ports to your devices controlled by LinCon-8000.

Step 6. Connect the DC power and turn it on.

Step 7. The Linux will start up, then please refer to the software user's manual for further operations and for developing your own applications.
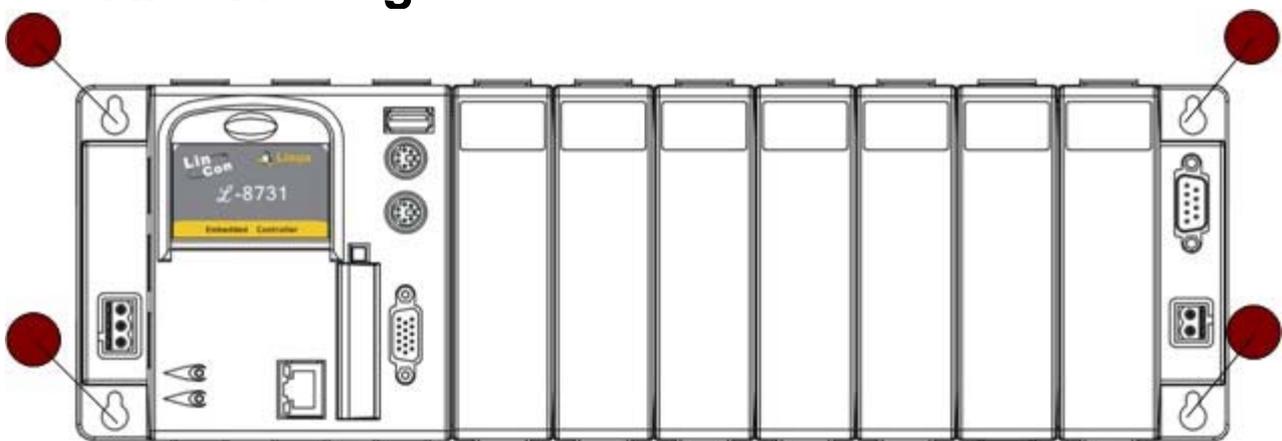
5. Mechanical Information

5.1 Dimensions
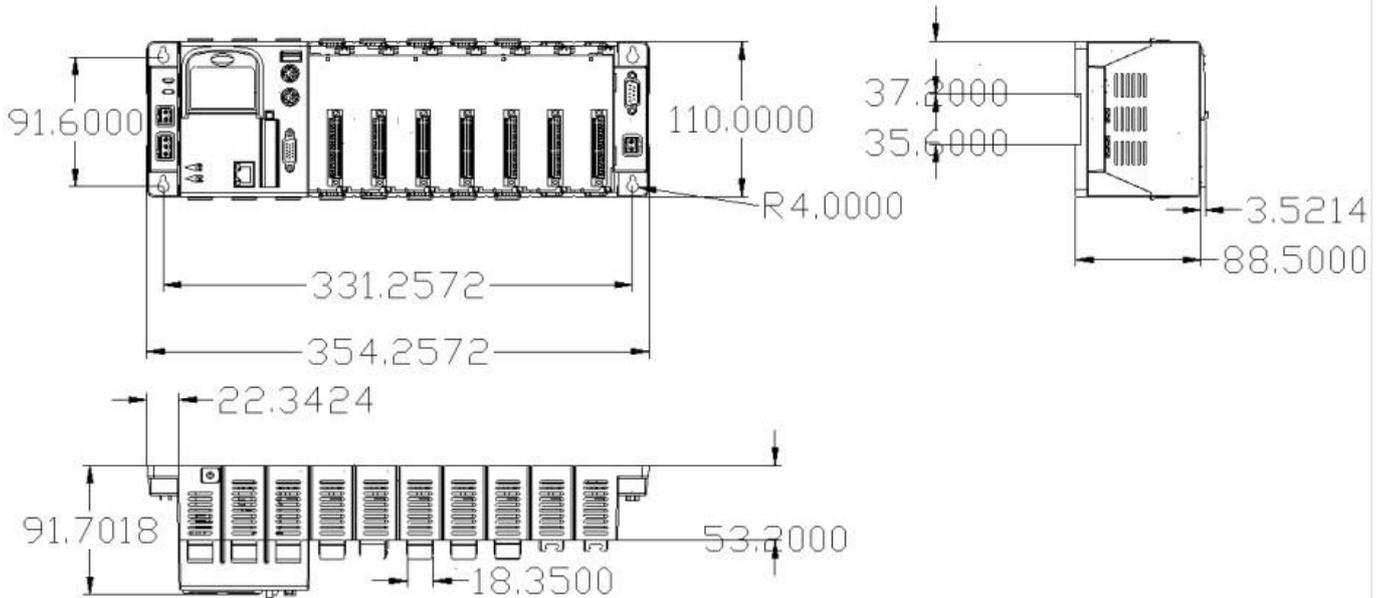
5.2 Dimensions Rail Mounting

5.3 Wall Mounting

5.4 Controller cover

For safety and the controller setting memo, the LinCon-8000 provides a main controller cover to protect the reset push button applied under the uncontrolled situation. And it also offers an expansion slot setting record area and others configuration memo areas. The operation procedure is provided below:

Step 1: Use your hand to push the main controller cover loose and pull-down the cover.

Step 2: Open the cover, as shown in the below figure below.

The Expansion I/O setting record is located directly on the main controller unit. The memo area is on the inside cover, as can be seen below. Note that the reset key is on the top-right corner protected by the controller cover.

(a)   **(b)**