

# WinCON8000-R2/R8

Compact Embedded Controller

## Hardware User's Manual



**REV 1.1**  
**2004/10/22**

## 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

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# 1. Introduction

## 1.1 Package List & Release Note

- Package List

For WinCon8000-R2/R8 (controller only)

- 1) One set of WinCon8000-R2/R8 hardware(controller)
- 2) One Compact Flash Memory Card for storing system files
- 3) One hardware user's manual (this manual)
- 4) One release note
- 5) One software utility CD with Software User's Manual included
- 6) JTAG cable.

For WinCon8000-R2 learning kit

- 1) One set of WinCon8000-R2 hardware(W-8731-G-R2)
- 2) ICPDAS's 8K series I/O modules

Slot1	I-8017h	14-bit 100K sampling rate 8-channel analog input module
Slot2	I-8024	4-channel 14-bit analog output module
Slot3	I-8040	32-channels digital output module
Slot4	I-8041	32-channels digital output module
Slot5	I-8077	16-channel Digital I/O Simulator Module
Slot6	DN-37	I/O Connector Block with DIN-Rail Mounting and 37-Pin D-Sub Connector
Slot7	DP-665	24V/1.7A 5V/0.5A Power Supply

- 3) One Compact Flash Memory Card for storing system files
- 4) One hardware user's manual (this manual)
- 5) One release note
- 6) One software utility CD with Software User's Manual included

### Note:

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

### Release Note:

It is recommended to read the release note & README.TXT firstly. The

release note is included in the shipping products. And the README.TXT is located in the CD\README.TXT. Some important information are provided in the release note & CD\README.TXT

## Ordering Information

### Standard WinCon-8000 Compact Embedded Controller

W-8001-G-R2 W-8301-G-R2 W-8701-G-R2	The hardware of W-8031-G-R2/W-8331-G-R2/W-8731-G-R2 is the same as W-8031-G/W-8331-G/W-8731-G. The standard WinCon-8000-R2 is implemented with extra 2-channel Serial RS-232, but without USB, PS/2 and VGA Ports.
W-8001-G-R8 W-8301-G-R8 W-8701-G-R8	The hardware of W-8031-G-R8/W-8331-G-R8/W-8731-G-R8 is the same as W-8031-G/W-8331-G/W-8731-G. The standard WinCon-8000-R8 is implemented with extra 8-channel 25-Pin D-Sub Serial RS-232, but without USB, PS/2 and VGA Ports.

### WinCon-8000-R2/R8 ISaGRAF Embedded Controller

W-8007-G-R2 W-8307-G-R2 W-8707-G-R2	The hardware of W-8037-G-R2/W-8337-G-R2/W-8737-G-R2 is the same as W-8037-G/W-8337-G/W-8737-G, but without USB, PS/2 and VGA Ports. The series of W-8x37-G-R2 are implemented with extra 2-channel Serial RS-232.
W-8007-G-R8 W-8307-G-R8 W-8707-G-R8	The hardware of W-8037-G-R8 /W-8337-G-R8/W-8737-G-R8 is the same as W-8037-G/W-8337-G/W-8737-G, but without USB, PS/2 and VGA Ports. The series of W-8x37-G-R8 are implemented with extra 8-channel 25-Pin D-Sub Serial RS-232.

## 1.2 WinCon8000-R2/R8 Series Introduction

The Wincon-8000-R2/R8 is the flagship no-display compact embedded controller manufactured by ICPDAS. With its powerful 32 bit engine (Strong Arm SA-1101, 208MHz) and embedded OS(Windows CE.NET 4.1), WinCon-8000-R2/R8 brings high speed and deterministic environment into the world of PC-based PLC. The application developers can directly develop their own programs in Microsoft's Visual Studio .NET and Embedded Visual tools with Wincon SDK, and then download them into Wincon-8000 for application.

The model type of WinCon-8000-R2/R8 is ruled as below chart.

Model	Slot	Additional RS-232 ports	Common Feature
W-8001-G-R2	0	2(MSP1~MSP2)	1) CPU: Intel compatible Strong ARM 206 MHz 2) Flash memory :32MB 3) SDRAM :64MB 4) EEPROM: 16KB 5) Compact Flash type II insert with ejector 6) 10BaseT Ethernet 7) RS-232: COM2 8) RS-485: COM3 9) OS: WinCE.Net Ver4.1
W-8301-G-R2	3	2(MSP1~MSP2)	
W-8701-G-R2	7	2(MSP1~MSP2)	
W-8001-G-R8	0	8(MSP1~MSP8)	
W-8301-G-R8	3	8(MSP1~MSP8)	
W-8701-G-R8	7	8(MSP1~MSP8)	

## 1.3 Contents of CD and CF memory card

CD Contents (located at R2\_R8 directory):

- WinCon8000 SDK
- RADM( Remote Administration utility for WinCon8000-R2/R8)
- Source code of demo programs(written in EVC, VB.net,)
- Software User's Manual
- References are given in ReadMe.txt in the CD
- Content of CF memory card.

CF memory card contents: (default is 128 Mbytes):

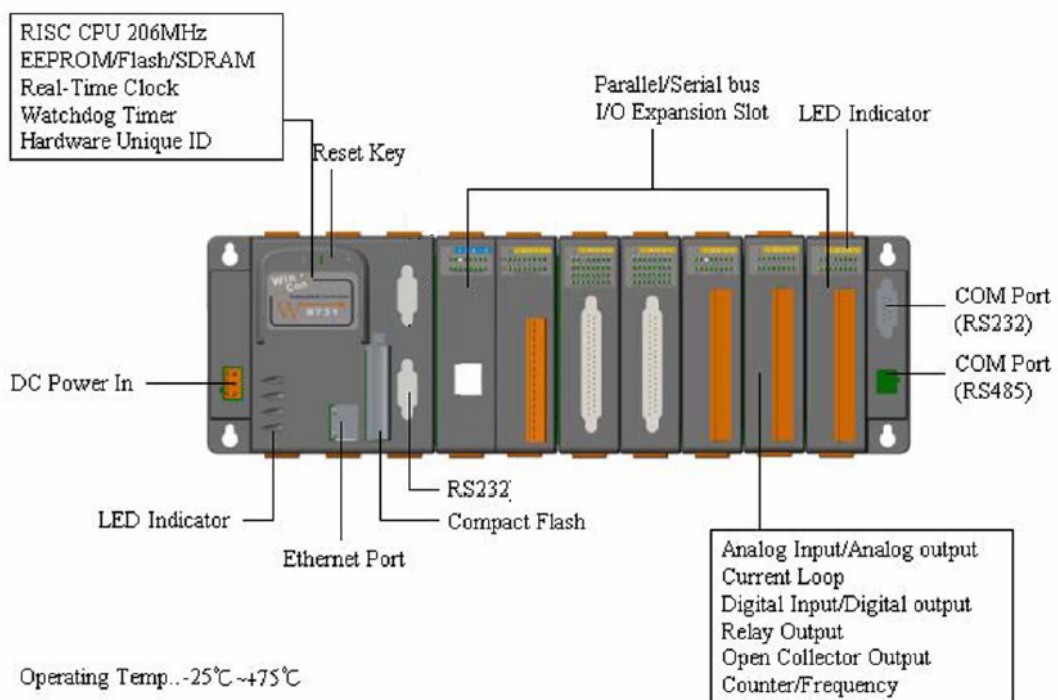
- WinCon8000-R2/R8 System files
- Demo programs
- Directories for FTP server and Http server
- References are given in Software User's Manual bundled CD

## 2. Hardware Information

The WinCon8000-R2/R8 system competes in performance with Industrial PCs, but lower in price. With RADM running in host PC, user can collect and modify system information or configuration of WinCon8000-R2/R8. User control programs and data can be saved in persistent storage via Compact Flash. Also, it does have communications capability via the built-in Ethernet and RS 232/485 interfaces

### 2.1 Front View of WinCon8000-R2/R8

The following figure demonstrates the hardware system of WinCon8000-R2/R8. It includes the main controller ,I/O expansion interface and additional RS-232 COM ports.(R2: 2 additional COM ports, R8: 8 additional COM ports)





## 2.2 Specifications

<b>Main Control Unit</b>	
<ul style="list-style-type: none"><li>■ Intel Strong ARM CPU, 206MHz</li><li>■ SRAM: 64M bytes</li><li>■ Flash Memory: 32M bytes</li><li>■ EEPROM: 16K bytes</li><li>■ 64-bit hardware unique serial number</li><li>■ Built-in Watchdog Timer</li></ul>	<ul style="list-style-type: none"><li>■ Real Time Clock</li><li>■ 10 Base T: NE2000 compatible</li><li>■ 1 Compact Flash slot: CF memory card</li><li>■ Reset button</li><li>■ Power LEDs</li></ul>
<b>Cabinet</b>	
<ul style="list-style-type: none"><li>■ COM0: Internal use</li><li>■ COM1: Serial Control for 87K Series, Not open to user.</li><li>■ COM2: RS-232</li><li>■ COM3: RS-485</li><li>■ I/O Expansion Slots</li></ul>	
<b>MISC</b>	
<ul style="list-style-type: none"><li>■ Power Supply: 20W, Unregulated +10Vdc to +30Vdc</li> <li>■ Environment: Operating Temp.: -25°C to +75°C Storage Temp.: -30°C to +85°C</li> <li>■ Humidity: 5~95%</li> <li>■ Dimensions:  418x110x75.5mm(7 slot) 418x110x75.5mm(3 slot)</li></ul>	
<b>I/O Module Selection</b>	
<ul style="list-style-type: none"><li>■ I-8000 serial modules, which include DI, DO, AO, AI...</li><li>■ I-87K serial modules, which include DI, DO, AO, AI...</li><li>■ I-7000 serial modules, which include DI, DO, AO, AI...</li></ul>	
For more information, please refer to the relative catalog or <a href="http://www.icpdas.com">http://www.icpdas.com</a> .	

### 3. Applications

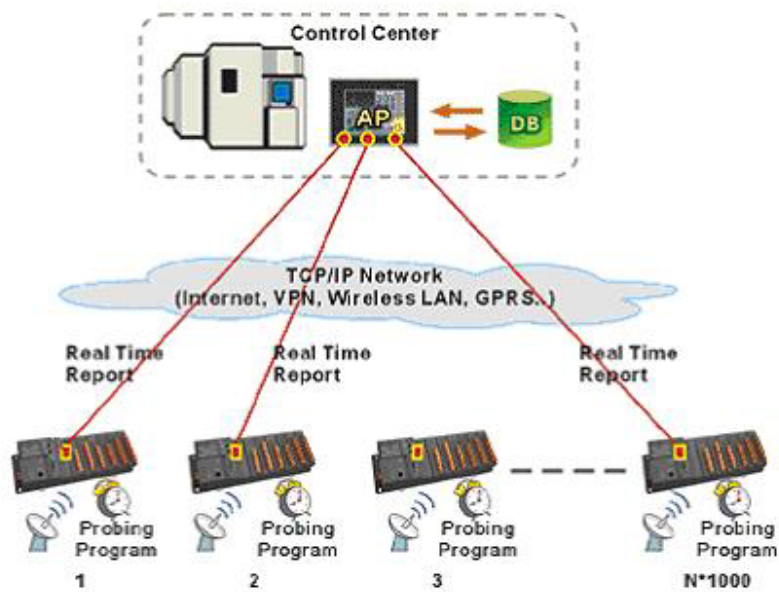
#### Case 1: Remote monitoring and Controlling

For off-site equipment with self-testing features:

- Equipments self-test periodically and transmitting result through iPushR Embedded back to the control center in real-time, and store it into database at the same time.

For off-site equipment without self-testing features:

- Install testing program into WinCon8000-R2/R8 for scheduled testing and send real-time result back to control center.



## Case 2: Locally Controlling and Monitoring

### Shop Floor manufacturing process monitoring.

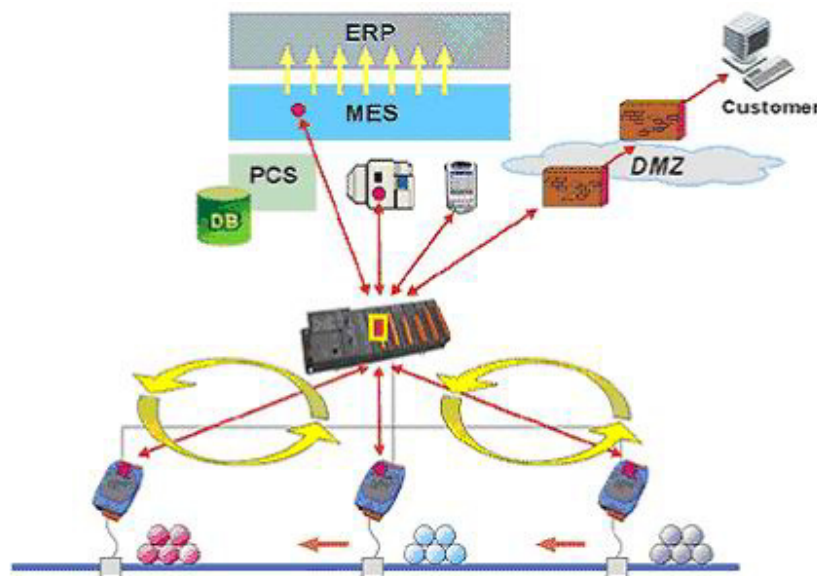
- A. Real-time monitoring results are delivered to control center and other control units through iPush<sup>®</sup> Embedded in WinCon-8000.
- B. Related manufacturing procedures can automatically adjust speed of production according to received real-time messages.
- C. Control center can immediately reacts to real-time alarm when abnormal situation occurs. At the same time, MES can also receive the same alert, take actions and inform ERP/MRP about this situation.
- D. **Benefits**
  1. Prevent delay in damage control when abnormal situation occur.
  2. Intelligent adjustment of production procedures allows staff to take further control of the monitoring work, with least efforts.
  3. Implement pull production system smoothly, and improve quality control within the manufacturing process.

### Build a real-time messaging platform between Shop floor system, MES system, and ERP system.

- A. Real-time monitoring results of each production procedure are delivered to control center through iPushR Embedded in WinCon-8000.
- B. MES is able to forecast the quality of WIPs, conditions and capacity of facilities, energy consumption according to the analyzed monitoring results, and then adjust production procedures as soon as possible.
- C. Thus, MES can provide real-time and cost-effective information of resources, production cycle and estimated production schedule for ERP/MRP.

### Allow Customers to monitor production line directly.

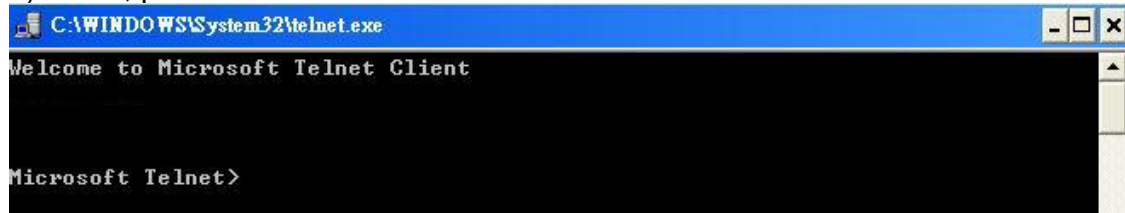
Customers are able to access plant network and receive real-time messages sent by iPushR Embedded in WinCon-8000, such as specified MRP/ERP status, production gradation, ...etc.



## 4. Quick Start for WinCon8000-R2/R8

4.1 Access the file system and execute the user's program in WinCon8000-R2/R8 by Telnet:

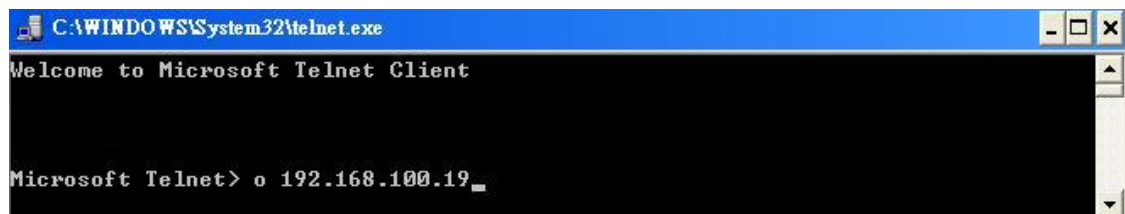
1) In PC, please execute Telnet in DOS command mode.



```
C:\WINDOWS\System32\telnet.exe
Welcome to Microsoft Telnet Client

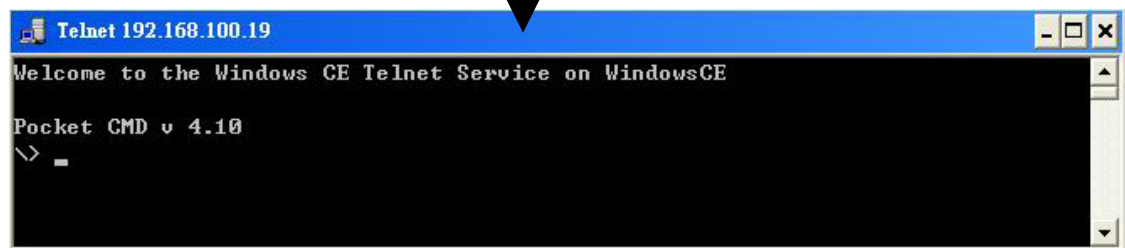
Microsoft Telnet>
```

2) Connect to the WinCon8000-R2/R8 (for this case, IP of R2/R8 is 192.168.100.19)



```
C:\WINDOWS\System32\telnet.exe
Welcome to Microsoft Telnet Client

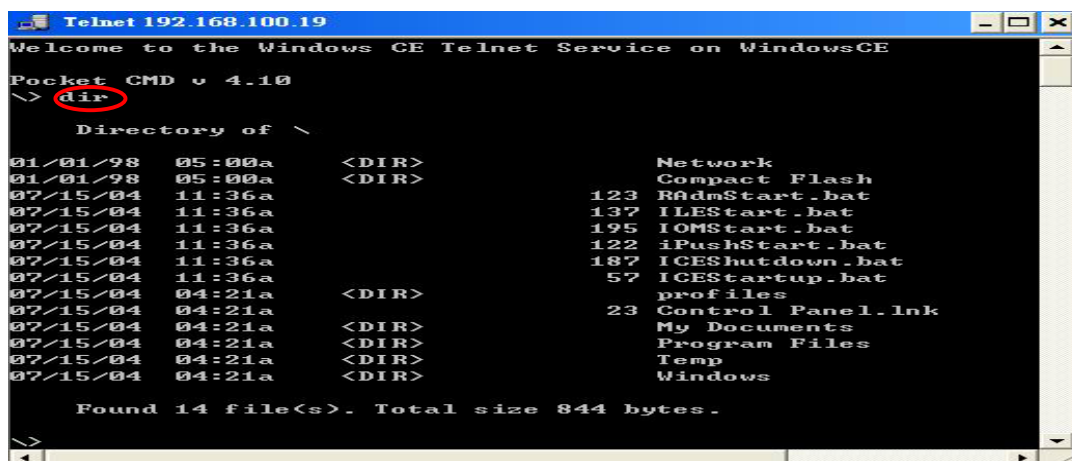
Microsoft Telnet> o 192.168.100.19_
```



```
Telnet 192.168.100.19
Welcome to the Windows CE Telnet Service on WindowsCE

Pocket CMD v 4.10
\> _
```

3) Key-in "DIR", then press "ENTER" to browse the file system of R2/R8.



```
Telnet 192.168.100.19
Welcome to the Windows CE Telnet Service on WindowsCE

Pocket CMD v 4.10
\> dir
Directory of \
01/01/98 05:00a <DIR> Network
01/01/98 05:00a <DIR> Compact Flash
07/15/04 11:36a 123 RAAdmStart.bat
07/15/04 11:36a 137 ILEStart.bat
07/15/04 11:36a 195 IOMStart.bat
07/15/04 11:36a 122 iPushStart.bat
07/15/04 11:36a 187 ICEShutdown.bat
07/15/04 11:36a 57 ICEStartup.bat
07/15/04 04:21a <DIR> profiles
07/15/04 04:21a 23 Control Panel.lnk
07/15/04 04:21a <DIR> My Documents
07/15/04 04:21a <DIR> Program Files
07/15/04 04:21a <DIR> Temp
07/15/04 04:21a <DIR> Windows

Found 14 file(s). Total size 844 bytes.
```

4) If user wants to execute "DEMO.EXE" in compact flash card..



## 4.2 Check or modify the configuration of your WinCon8000-R2/R8 via RA.

-----At WinCon8000-R2/R8-----

Step 1: Insert the bundled CF memory card into the CF slot.

Step 2: Connect your WinCon8000-R2/R8 to LAN

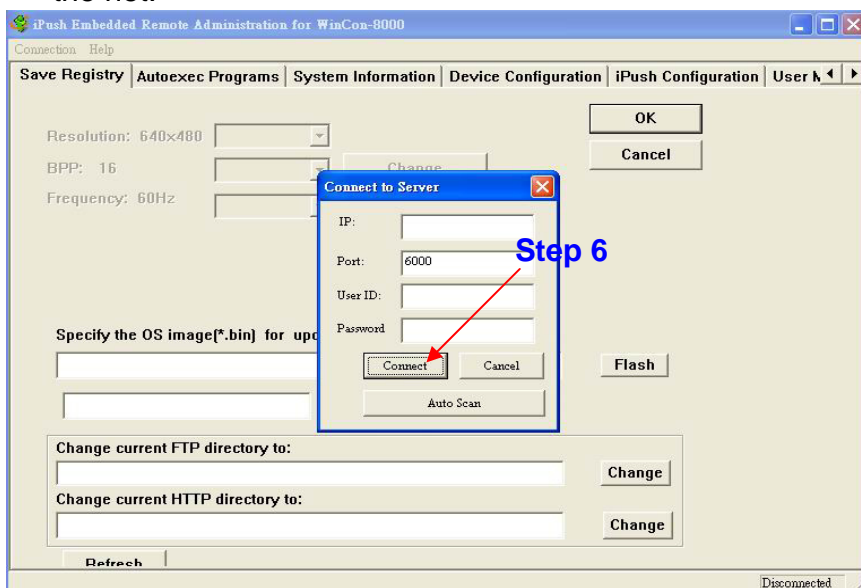
Step 3: Insert your 8K/87K series I/O modules in slots of expansion slots.

Step 4: Power on your R2-R8

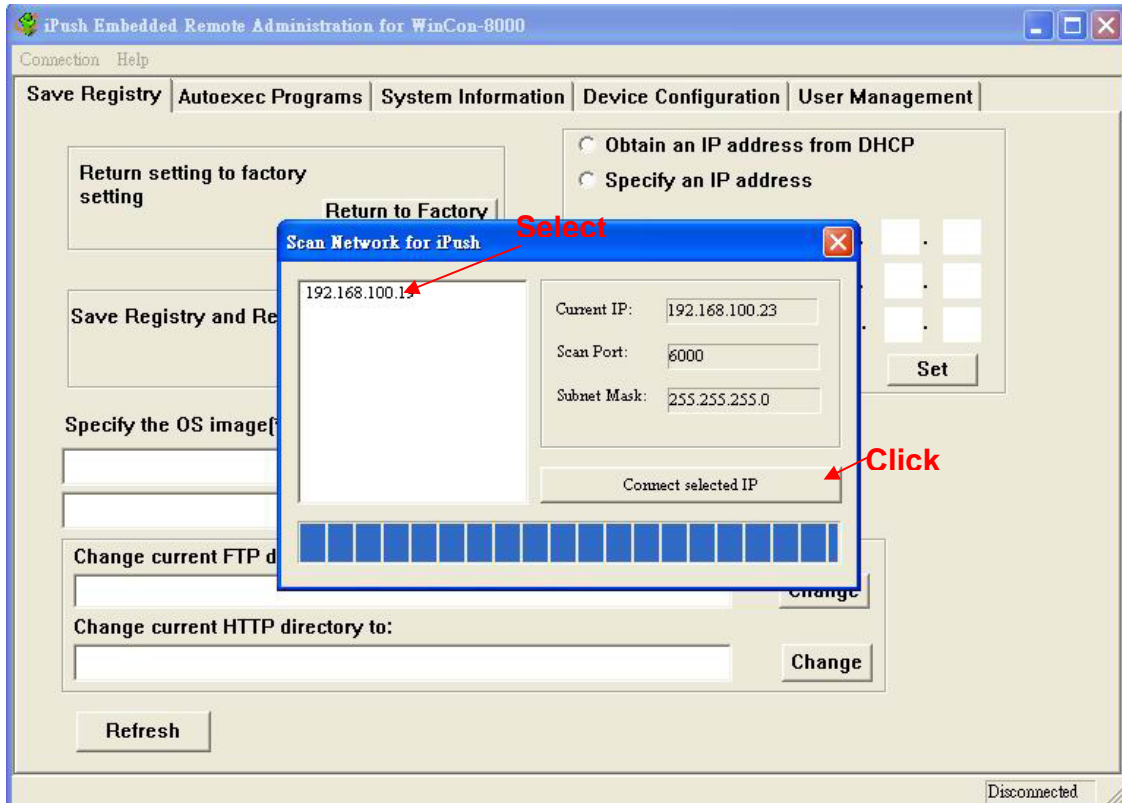
-----At PC side-----

Step 5: Execute RA

Step 6: Select "Auto Scan" button to scan the existing WinCon8000-R2/R8 on the net.



Step 7: Here pop-up a window, and it will display the IP address of existing WinCon8000-R2/R8. Choose the one which you desired to check the configuration then click “Connect selected IP” to continue.

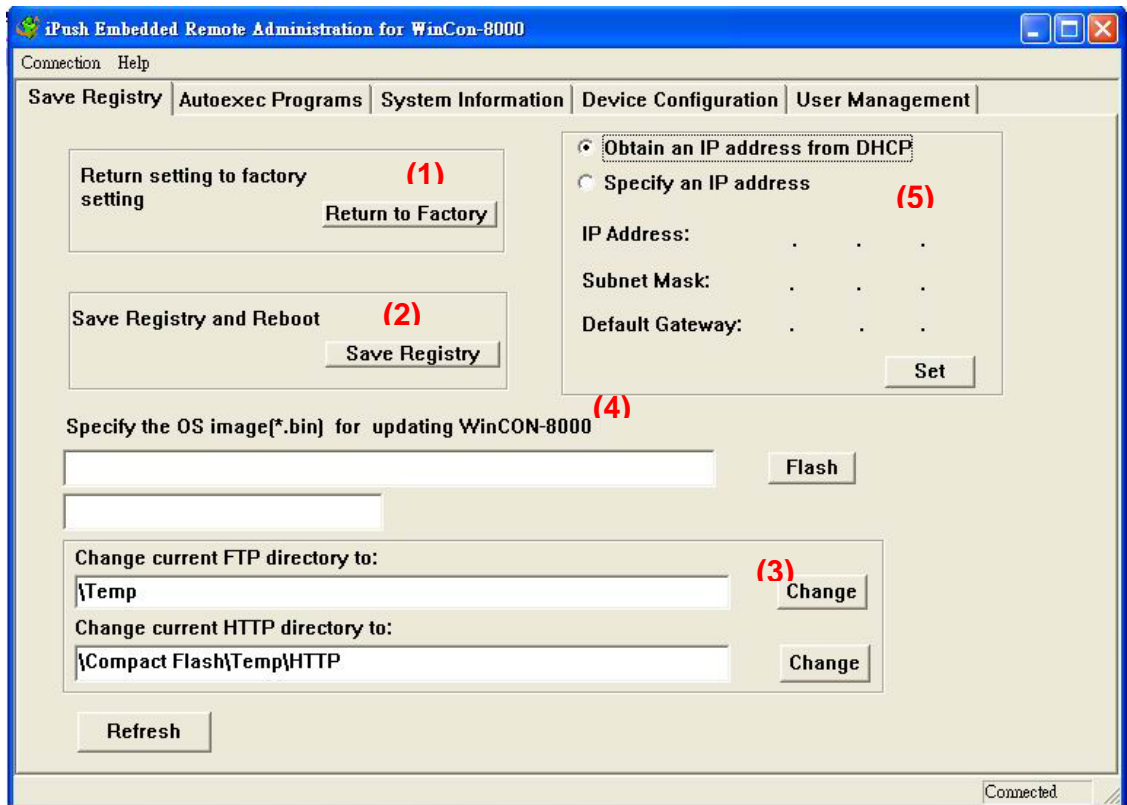


Step8: Input username as “wc8k” and password as “wc8kadm” then click “connect” button.





Step9: Now, you can use RA to check or modify the configuration via Ethernet. Here we introduce all pages on RA. To access the real time information on each page, please click “Refresh” button.

**-Save Registry Page-**



There are some utilities in this page:

- 1) Return to factory setting: If users want to recover registry settings to factory default settings, just click “Recover to factory settings” button.
- 2) Save Registry and Reboot: If users want to save the current registry settings , just click “Save Register and Reboot” button. Users need to reconnect RA after WinCon-8000 R2/R8 rebooting.
- 3) View and Set FTP & HTTP directory: users can use WinCon8000-R2/R8 as FTP or HTTP server. To view the existing FTP and HTTP directory, just click  .To change to other directories, please input the existing path in WinCon8000-R2/R8, then click .

- 4) Update OS image to WinCon8000-R2/R8: To update OS image of WinCon8000-R2/R8, please input the OS image location path in WinCon8000-R2/R8, then click **Flash**. It may spend 30 min to complete the OS image update, please be patient! (During OS image updating, RADM may disconnect with WinCon8000-R2/R8. User can also use debug cable (JTAG cable) to monitor the status of flash processing.
- Debug message while OS image update processing

```
FlashErase, Seg No. : 80
FlashErase, Seg No. : 81
FlashErase, Seg No. : 82
FlashErase, Seg No. : 83
FlashErase, Seg No. : 84
FlashErase, Seg No. : 85
FlashErase, Seg No. : 86
Flash WriteString : seg : 7, offset 0, data size : 40000
Flash WriteString : seg : 8, offset 0, data size : 40000
Flash WriteString : seg : 9, offset 0, data size : 40000
Flash WriteString : seg : 10, offset 0, data size : 40000
Flash WriteString : seg : 11, offset 0, data size : 40000
Flash WriteString : seg : 12, offset 0, data size : 40000
Flash WriteString : seg : 13, offset 0, data size : 40000
Flash WriteString : seg : 14, offset 0, data size : 40000
Flash WriteString : seg : 15, offset 0, data size : 40000
Flash WriteString : seg : 16, offset 0, data size : 40000
Flash WriteString : seg : 17, offset 0, data size : 40000
Flash WriteString : seg : 18, offset 0, data size : 40000
Flash WriteString : seg : 19, offset 0, data size : 40000
Flash WriteString : seg : 20, offset 0, data size : 40000
Flash WriteString : seg : 21, offset 0, data size : 40000
Flash WriteString : seg : 22, offset 0, data size : 40000
```

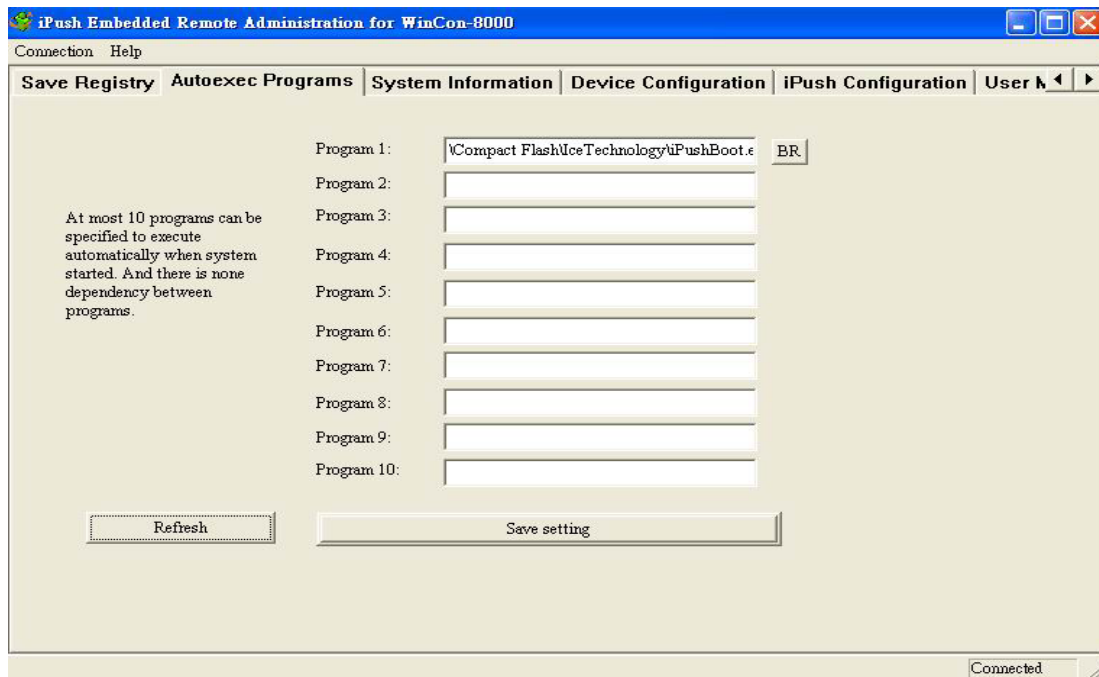
After OS image update finished, WinCon8000-R2/R8 will reboot automatically. Please reconnect RADM if necessary.

#### 5) Change LAN setting:

The default LAN setting of WinCon-8000 R2/R8 is Fixed IP: **192.168.100.100**. If users want to modify IP setting to DHCP or other fixed IP, please choose the correct setting depending on your requirement. After “set” button clicked, please reboot your WinCon-8000-R2/R8 to make the changes effective.



## -Autoexec Programs-




### What's Autoexec program (for WinCon-8000)

Autoexec programs can be auto started when WinCon-8000 boots. The administrator can use tab <Autoexec Programs> in Remote Administration to add or remove item in the program list.

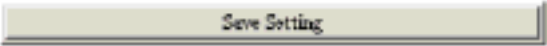
### Configure Autoexec Programs

Step 1: Change the working tab to <Autoexec Programs>.

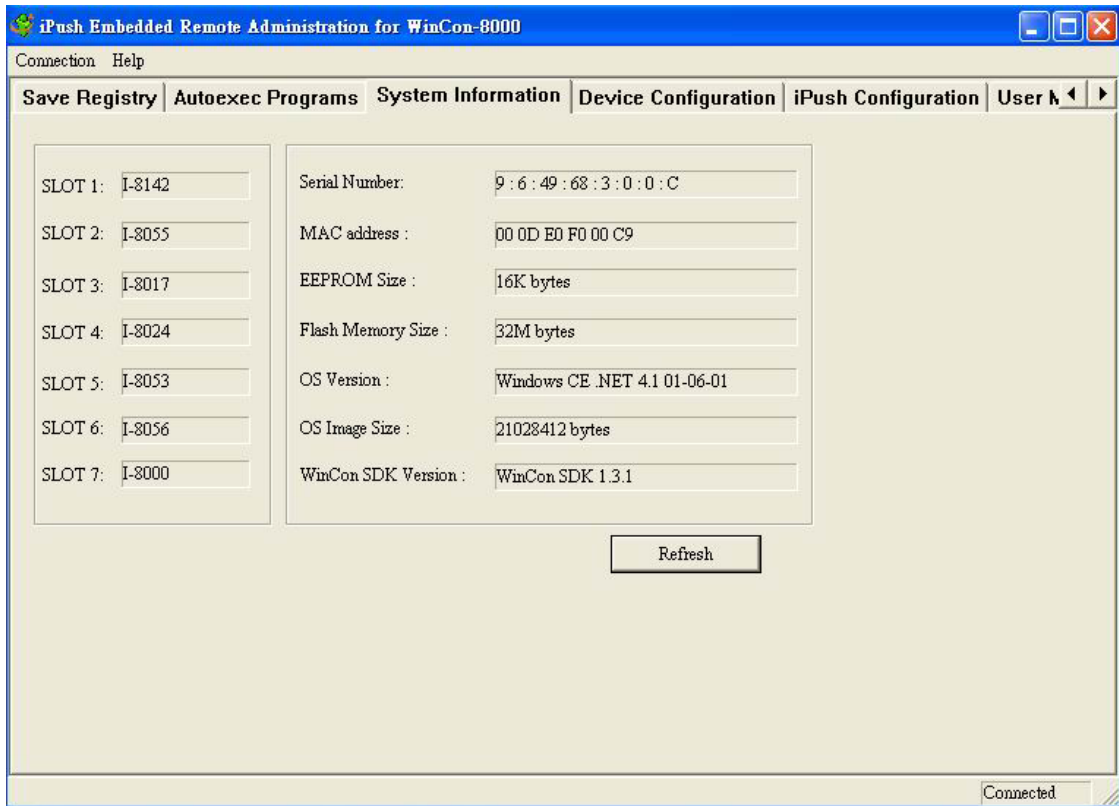
Step 2: Click  to get the current setting of Autoexec Programs in WinCon-8000. The setting will be displayed in the program list. Figure below shows there is one program named 'iPushBoot.exe' set as autoexec program:

Step 3: Add or remove the autoexec programs by editing the program list. Please remember each program must be given a full path from the root directory '\ in CE's file system.

Step 4: Add or remove the autoexec programs by editing the program list. Please remember that each program must be given a full path from the root directory '\ in CE file system.

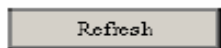
Step 5: Click , the changes will be updated to WinCon-8000.

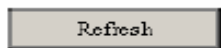
## -System Information-



The tab <System Information> gives you the system information about WinCon-8000 you connected.

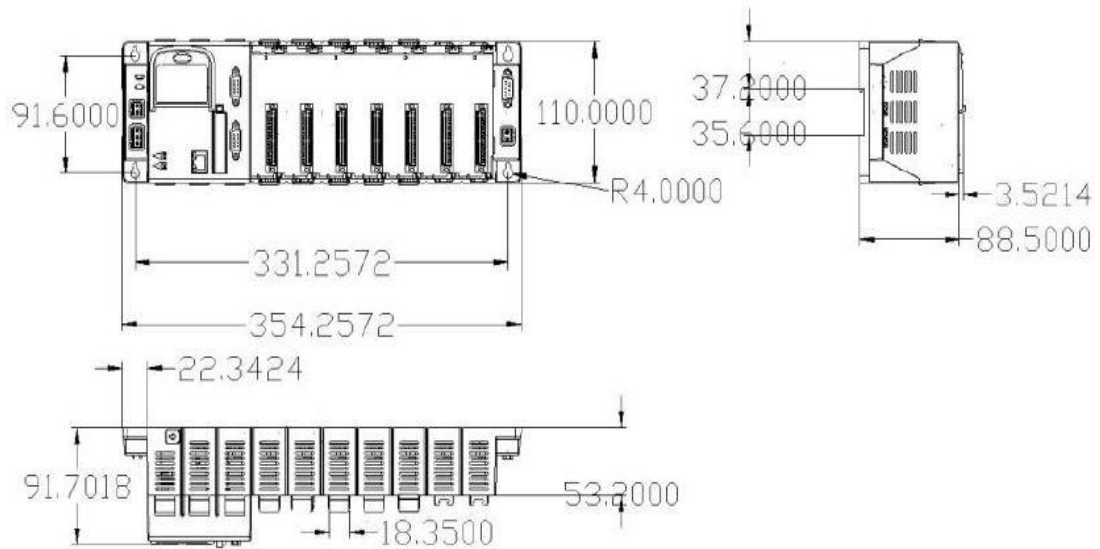
Look up system information of WinCon-8000



Just click  to show the information, as figure below. On the left side of the tab, you may see the I/O modules have been plugged into slot 1~7. On the right side, you can see the information about hardware, firmware, operating system, and SDK.

## 5. Mechanical Information

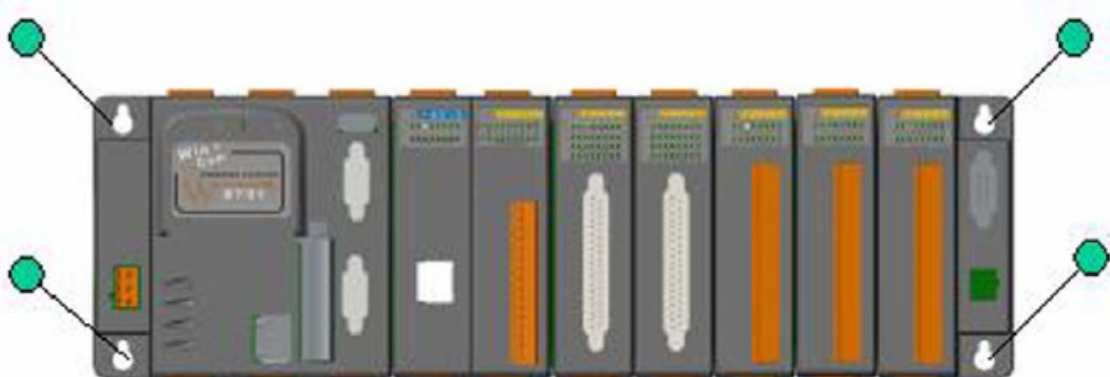
### 5.1 Dimensions



### 5.2 Dimensions Rail Mounting



### 5.3 Wall Mounting



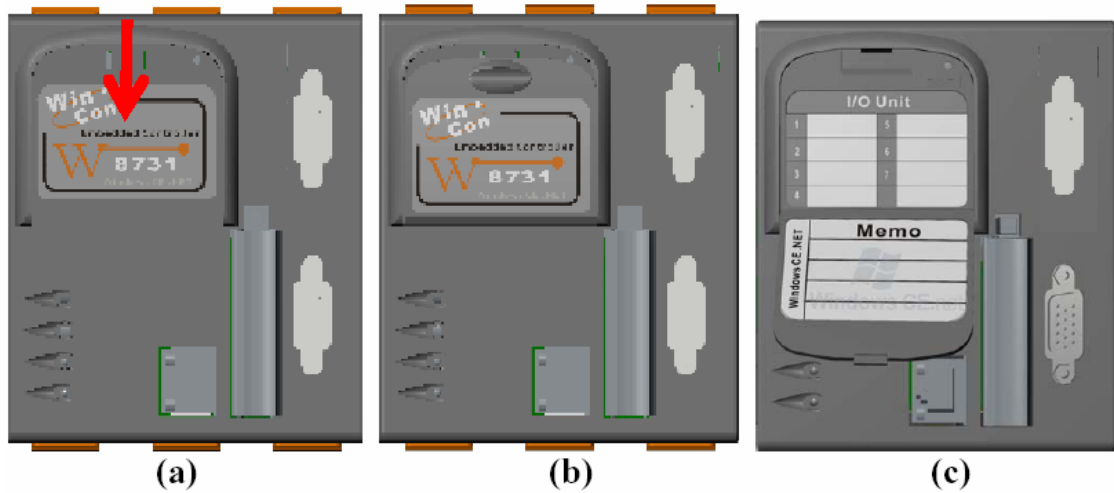
## 5.4 Controller cover

For safety and controller setting memo, WinCon8000 provides a main controller cover to protect the reset push button to be applied under the uncontrolled situation. And it also offers a expansion slot setting record area and others configuration memo area. The operation procedure is as below:

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

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

The Expansion I/O setting record is right on the main controller unit. And the memo area is on the inside cover, as shown in below. Note that the reset key is on the right-up corner protected by the controller cover.



## 5.4 Wincon-8000- R8 DB25 connector pin assignment

