

PAC Motion Control System

Advance Motion controller



Benefit:

- Low cost
- No Hard disk and No Fan
- High stability and reliability
- Fast boot speed
- Standard VGA or Touch Panel
- Easy integration
- Supporting more communication interface
- High performance motion
- Easy expandable distributed I/O



ICPDAS CO., LTD.
<http://www.icpdas.com>

PACs

eI/O

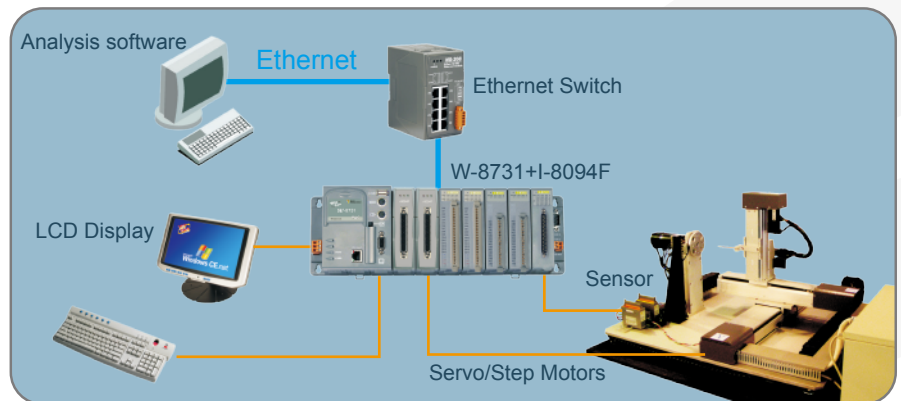
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Advance Motion controller - PAC System

Introduction:

PAC with SoftLogic (IEC-61131-3) not only can be used to replace traditional PLC but also can integrate motion control more effectively than PLC. Many different applications in the field of machine automation require motion control together with logic control. Typical motion control includes point-to-point, linear interpolation, circulation interpolation or the combination of the previously mentioned items and etc. PAC provides a good way to glue motion control and logic control together due to the openness of its software and hardware architecture. PLCOpen also develops 3 formal documentations (PLCopenMC_1~MC3) about the standardization of Motion FB that will be used in the SoftLogic programs. Although the standardization of Motion FB is not compulsory in SoftLogic, the trend of standardization really narrows the gap between motion control vendors and users. ICPDAS also provides motion control products together with its PAC products to satisfy the requirements of machine automation applications.



Benefit:

- Low cost
- No Hard disk and No Fan
- High stability and reliability
- Fast boot speed
- HMI: Standard VGA or Touch Panel
- Easy integration
- Supporting more communication interface (RS232/RS485/Ethernet/Can Bus .etc.)
- High performance motion
- Easy expandable distributed I/O

PAC Motion Controller

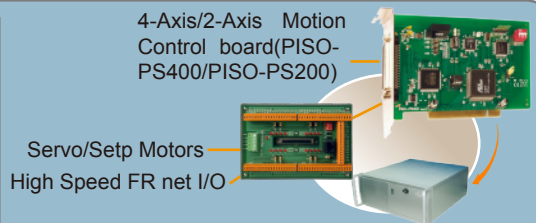
What is The Wincon PAC

The WinCon-8000 is a leading edge embedded platform of ICP DAS running with Windows CE .NET operating system and its advantages includes hard real-time capability, small core size, fast boot speed, interrupt handling, achievable deterministic control and low cost. Using Windows?CE .NET in the WinCon-8000 gives it the ability to run PC-based Control software such as Visual Basic .NET, Visual C#, Embedded Visual C++, SCADA software, Soft PLC ...etc.

WinCon = IPC + PLC



Note: ICPDAS as a leading automation not only provides PAC motion control module for own PAC system but also develops PCI bus motion control products for PC based control. There are two cards (PISO-PS400 and PISO-PS200) for PC based which are position control modes.



I-8094H

Advance Motion Module of PAC



Feature

- I-8094H/I-8094A = Small system + MiniOS7(DOS like OS)
+ I-8094F(4axes motion control module) Full function of I-8094F
- On board CPU
- On board SRAM: 512KB
- On board FRAM: 128KB
- On board EEPROM: 512KB
- Build-in Mini OS(DOS like)
- Support Macro Function
- Support Macro program (Integrated Development Environment)
- Development software: Win CE→eVC/VC.net/VB.net MiniOS7→TC3.0/MSC/BC3.0
- Work on a PAC: Wincon
- Expandable distributed I/O: 128 DI & 128 DO Via two-wired FRnet interface.(only for I-8094H)

Wincon + I-8094H/I-8094A



Feature

- HMI: Standard VGA or Touch Panel
- More communication interface: Ethernet, RS232, RS485, USB.....
- Direct control I-8094H/I-8094A by DPRAM
- OS: Win CE
- Double CPU: Parallel process system efficiency is high
- High performance motion: The frame of Macro Program is stand alone run in I-8094H module.
- Hardware supports maximum up to 7 I-8094H/I-8094A modules.
- Don't take up the resource of System when executing motion control
- No Hard disk & No Fan

Advance Motion Module of PAC



Feature

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- More communication interface: RS232, RS485, USB.....
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Application

Field

- X-Y-Z Table
- Fix-Pitch Stamping Machine
- Transfer Machine
- Spinner
- Load/Unload

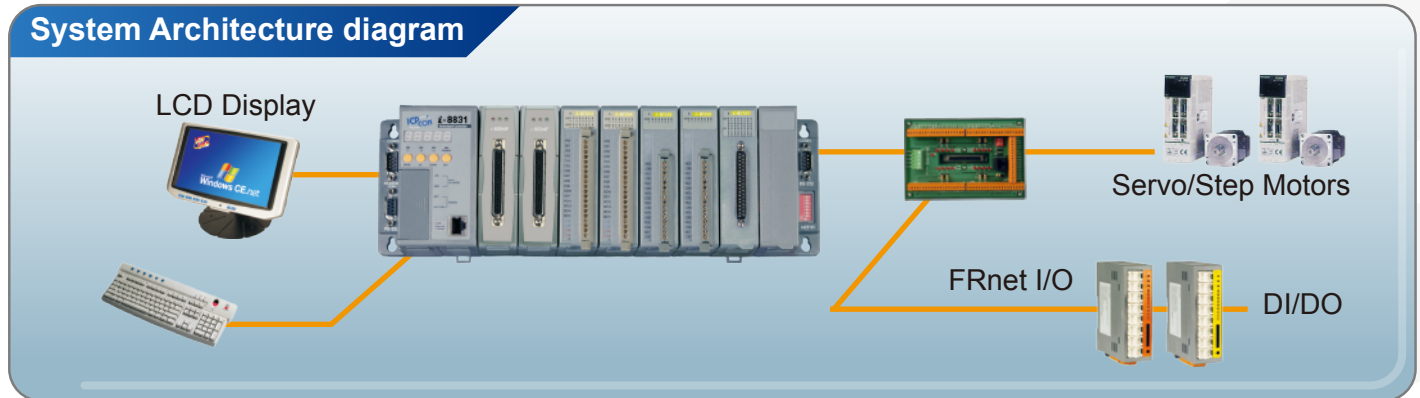
Motion control in the Wiring machine

Character requirement on Wiring machine:

The main requirements of Wiring machine upon the Motion control are the High & Stable wiring process, diverse & Precise line arrangement, and complicate I/O control; how to let the Motion control card or module able to implement the process sharply and quickly, control the complicate I/O & data operation, has already determined the performance of Wiring machine.

The Solution Plan:

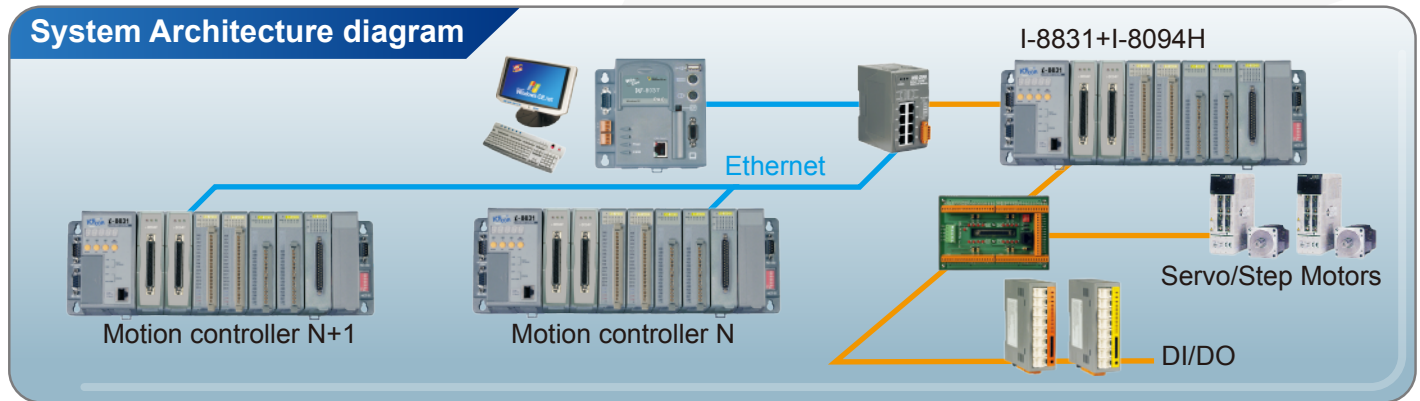
Wincon8xxx + I-8xxxDI/O module + I-8094 (including the wire and connection plate),



Distributed Motion control system

Case1: Long Transfer Machine/ Load_Unload

Solution: Wincon8x4x + I-8000 system + I-8xxxDI/O module + I-8094H



Case2: Long Transfer Machine/ Load_Unload

Solution: IPC + I-8000 System + I-8xxxDI/O module + I-8094H

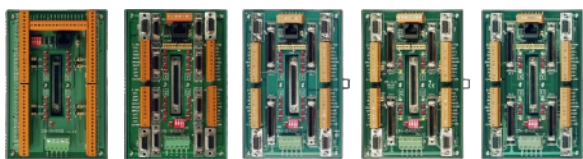


I-8094, I-8094F, I-8092F

Multi-axis Motion Module of PAC



DN-8237G



DN-8468G DN-8468M DN-8468P DN-8468D DN-8468Y



DN-8237M DN-8237G DN-8237D DN-8237Y DN-8237P



I-8092F I-8094 I-8094F

Feature

- Independent 2-axes motion control (I-8092F)
- Independent & Synchronous 4-axes motion control (I-8094, I-8094F)
- Support for manual Pulse generator and jog function
- 2~3 axes linear interpolation function (I-8092F only support 2-axes linear interpolation)
- 2-axes circular interpolation function
- Continuous interpolation function
- Programmable T/S-curve acceleration and deceleration
- A maximum of 4M pps pulse output rate for each axis
- Pulse output types: CW/CCW or Pulse/Direction
- 32-bit encoder counter for each axis
- Encoder input types: A/B phase or Up/Down
- Programmable automatic homing for each axis
- Position comparison management and software limits
- Expandable distributed I/O: 128 DI & 128 DO Via two-wired FRnet interface. (for I-8094F & I-8092F)
- Many synchronous actions(event-triggered actions)(For I-8094, I-8094F)

Application Field

- X-Y Table
- 2-Axes Testing machine
- X-Y-Z Table for i-8094/i-8094F
- Fix-Pitch Stamping Machine for i-8094/i-8094F
- Transfer Machine for i-8094/i-8094F
- Spinner for i-8094/i-8094F
- Load/Unload for i-8094/i-8094F

Application stories

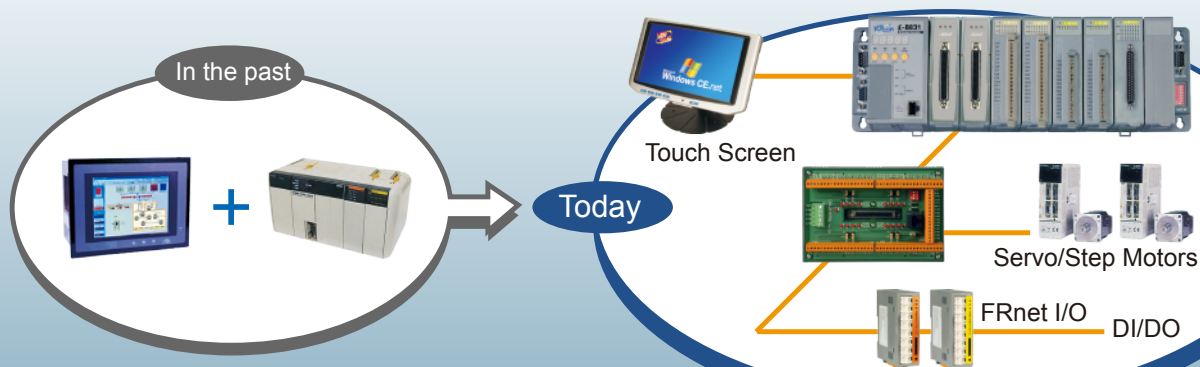
Complex Automatic Heel Seat & Side Cement Lasting Machine

Character requirement on Complex Automatic Hell Seat & Side Cement Lasting Machine.

The Solution Plan:

Wincon-8xxx + I-8094F + FRnet DI/O module (including the wire and connection plate),

System Architecture diagram



PISO-PS400 and PISO-PS200

Motion card of PC-based controller



Feature

- Independent 2-axes motion control (PISO-PS200)
- Independent & Synchronous 4-axes motion control (PISO-PS400)
- Support for manual Pulse generator and jog function
- 2~3 axes linear interpolation function (PISO-PS200 only support 2-axes linear interpolation)
- 2-axes circular interpolation function
- Continuous interpolation function
- Programmable T/S-curve acceleration and deceleration
- A maximum of 4M pps pulse output rate for each axis
- Pulse output types: CW/CCW or Pulse/Direction
- 32-bit encoder counter for each axis
- Encoder input types: A/B phase or Up/Down
- Programmable automatic homing for each axis
- Position comparison management and software limits
- Expandable distributed I/O: 128 DI & 128 DO Via two-wired FRnet interface.
- Many synchronous actions(event-triggered actions)(PISO-PS400)

Application Field

- X-Y Table
- 2-Axes Testing machine
- X-Y-Z Table for PISO-PS400
- Fix-Pitch Stamping Machine for PISO-PS400
- Transfer Machine for PISO-PS400
- Spinner for PISO-PS400
- Load/Unload for PISO-PS400

Application stories

Motion control in the Wiring machine

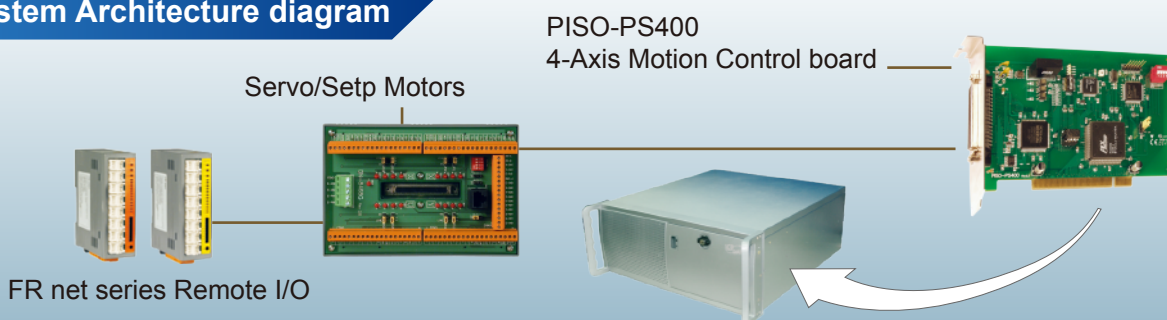
Character requirement on Wiring machine:

The main requirements of Wiring machine upon the Motion control are the High & Stable wiring process, diverse & Precise line arrangement, and complicate I/O control; how to let the Motion control card or module able to implement the process sharply and quickly, control the complicate I/O & data operation, has already determined the performance of Wiring machine.

The Solution Plan:

Computer + PISO-PS400 (including the wire and connection plate) + PCI interface I/O card.

System Architecture diagram



Motion's module/Card selection information:

Bus interface	I-8000 series for I-8000/WinCon/LinCon			PCI	
Model Name	I-8092F-G/S	I-8094F-G/S	I-8094H-G/S	PISO-PS400/S	PISO-PS200/S
Control Axis	2-Axes	4-Axes	4-Axes	4-Axes	2-Axes
Connector	D-SUB 37-Pin	SCSI 68-Pin	SCSI 68-Pin	SCSI 68-Pin	D-SUB 37-Pin
Frequency of Pulse output	4M PPS	4M PPS	4M PPS	4M PPS	4M PPS
Line interpolation	2-Axes	2~3-Axes	2/3-Axes	2~3Axes	2-Axes
Circular interpolation	2-Axes	2-Axes	2-Axes	4-Axes	2-Axes
Arbitrary curve interpolation	N/A	N/A	2~3Axes	N/A	N/A
Speed profile	T/S-curve	T/S-curve	T/S-curve	T/S-curve	T/S-curve
Pulse output signal	CW/CCW Pulse/Dir.	CW/CCW Pulse/Dir.	CW/CCW Pulse/Dir.	CW/CCW Pulse/Dir.	CW/CCW Pulse/Dir.
Encoder input signal	A/B-Phase Up/Down	A/B-Phase Up/Down	A/B-Phase Up/Down	A/B-Phase Up/Down	A/B-Phase Up/Down
Automatic Homing	4 steps	4 steps	4 steps	4 steps	4 steps
Position counter	EP(Encoder) /LP(command)	EP(Encoder) /LP(Command)	EP(Encoder) /LP(Command)	EP(Encoder) /LP(Command)	EP(Encoder) /LP(Command)
Other DI Signal	1ch for each axis	1ch for each axis	1ch for each axis	1ch for each axis	1ch for each axis
Input signal of servo motor	Alarm in-Position	Alarm in-Position	Alarm in-Position	Alarm in-Position	Alarm in-Position
Output signal	2-DO for each axis Servo on/off Common Use	1-DO for each axis Servo on/off Common Use	1-DO for each axis Servo on/off Common Use	1-DO for each axis Servo on/off Common Use	2-DO for each axis Servo on/off Common Use
Limit signal input	Yes	Yes	Yes	Yes	Yes
Emergency Signal input	Yes	Yes	Yes	Yes	Yes
Software Limit function	Yes	Yes	Yes	Yes	Yes
Filter of Digital input	Yes	Yes	Yes	Yes	Yes
External Pulser input	Fixed/continuous /wheel	Fixed/continuous /wheel	Fixed/continuous /wheel	Fixed/continuous /wheel	Fixed/continuous /wheel
LED lighter	Yes	Yes	Yes	Yes	Yes
FRnet (High speed I/O)	128DI · 128DO	128DI · 128DO	128DI · 128DO	128DI · 128DO	128DI · 128DO
Terminal Board	DN-8237G DN-8237M DN-8237P DN-8237Y DN-8237D	DN-8468G DN-8468M DN-8468P DN-8468Y DN-8468D	DN-8468G DN-8468M DN-8468P DN-8468Y DN-8468D	DN-8468G DN-8468M DN-8468P DN-8468Y DN-8468D	DN-8237G DN-8237M DN-8237P DN-8237Y DN-8237D

Terminal Board selection Information:

Name/Function	Function Description
DN-8468G/DN-8237G	For General purpose
DN-8468M/DN-8237M	For Mitsubishi Servo Amplifier
DN-8468Y/DN-8237Y	For Yaskawa Servo Amplifier
DN-8468D/DN-8237D	For Detla Servo Amplifier

Motion Controller selection Information:

WinCon-8000 selection Information:	
W-8031	0-slot WinCE-based PAC
W-8331	3-slot WinCE-based PAC
W-8731	7-slot WinCE-based PAC
W-8041	0-slot WinCE-based PAC with Dual Ethernet Port
W-8341	3-slot WinCE-based PAC with Dual Ethernet Port
W-8741	7-slot WinCE-based PAC with Dual Ethernet Port
I-8000 selection Information:	
I-8411	4-slot MiniOS7(DOS-like) PAC
I-8811	8-slot MiniOS7(DOS-like) PAC
I-8431	4-slot MiniOS7(DOS-like) Ethernet PAC
I-8831	8-slot MiniOS7(DOS-like) Ethernet PAC
I-8431-80	4-slot MiniOS7(DOS-like) Ethernet PAC with 80Mhz CPU
I-8831-80	8-slot MiniOS7(DOS-like) Ethernet PAC with 80Mhz CPU



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