Benefits:

- 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
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.
Advance Motion Module

I-8094H

Advance Motion Module of PAC

Feature
- I-8094H/I-8094A = Small system + MiniOS7 (DOS like OS)
  + I-8094F (4 axes 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

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Application

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

http://www.icpdas.com
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-8xxxI/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

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),
**Motion card of PC-based controller**

<table>
<thead>
<tr>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Independent 2-axes motion control (PISO-PS200)</td>
</tr>
<tr>
<td>● Independent &amp; Synchronous 4-axes motion control (PISO-PS400)</td>
</tr>
<tr>
<td>● Support for manual Pulse generator and jog function</td>
</tr>
<tr>
<td>● 2~3 axes linear interpolation function (PISO-PS200 only support 2-axes linear interpolation)</td>
</tr>
<tr>
<td>● 2-axes circular interpolation function</td>
</tr>
<tr>
<td>● Continuous interpolation function</td>
</tr>
<tr>
<td>● Programmable T/S-curve acceleration and deceleration</td>
</tr>
<tr>
<td>● A maximum of 4M pps pulse output rate for each axis</td>
</tr>
<tr>
<td>● Pulse output types: CW/CCW or Pulse/Direction</td>
</tr>
<tr>
<td>● 32-bit encoder counter for each axis</td>
</tr>
<tr>
<td>● Encoder input types: A/B phase or Up/Down</td>
</tr>
<tr>
<td>● Programmable automatic homing for each axis</td>
</tr>
<tr>
<td>● Position comparison management and software limits</td>
</tr>
<tr>
<td>● Many synchronous actions(event-triggered actions)(PISO-PS400)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>● X-Y Table</td>
</tr>
<tr>
<td>● 2-Axes Testing machine</td>
</tr>
<tr>
<td>● X-Y-Z Table for PISO-PS400</td>
</tr>
<tr>
<td>● Fix-Pitch Stamping Machine for PISO-PS400</td>
</tr>
<tr>
<td>● Transfer Machine for PISO-PS400</td>
</tr>
<tr>
<td>● Spinner for PISO-PS400</td>
</tr>
<tr>
<td>● Load/Unload for PISO-PS400</td>
</tr>
</tbody>
</table>

**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.
Motion’s module/Card selection information:

<table>
<thead>
<tr>
<th>Bus interface</th>
<th>I-8000 series for I-8000/WinCon/LinCon</th>
<th>PCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Name</td>
<td>I-8092F-G/S</td>
<td></td>
</tr>
<tr>
<td>Control Axis</td>
<td>2-Axes</td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>D-SUB 37-Pin</td>
<td>N/A</td>
</tr>
<tr>
<td>Frequency of Pulse output</td>
<td>4M PPS</td>
<td>4M PPS</td>
</tr>
<tr>
<td>Line interpolation</td>
<td>2-Axes</td>
<td>2-Axes</td>
</tr>
<tr>
<td>Circular interpolation</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Arbitrary curve interpolation</td>
<td>2-Axes</td>
<td>2-Axes</td>
</tr>
<tr>
<td>Speed profile</td>
<td>T/S-curve</td>
<td></td>
</tr>
<tr>
<td>Pulse output signal</td>
<td>CW/CCW/Pulse/Dir.</td>
<td>CW/CCW/Pulse/Dir.</td>
</tr>
<tr>
<td>Encoder input signal</td>
<td>A/B-Phase/Up/Down</td>
<td>A/B-Phase/Up/Down</td>
</tr>
<tr>
<td>Automatic Homing</td>
<td>4 steps</td>
<td>4 steps</td>
</tr>
<tr>
<td>Position counter</td>
<td>EP(Encoder)/LP(Command)</td>
<td>EP(Encoder)/LP(Command)</td>
</tr>
<tr>
<td>Other Di Signal</td>
<td>1ch for each axis</td>
<td>1ch for each axis</td>
</tr>
<tr>
<td>Input signal of servo motor</td>
<td>Alarm in-Position</td>
<td>Alarm in-Position</td>
</tr>
<tr>
<td>Output signal</td>
<td>2-DO for each axis</td>
<td>1-DO for each axis</td>
</tr>
<tr>
<td>Limit signal input</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Emergency Signal input</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Software Limit function</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Filter of Digital input</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>External Pulser input</td>
<td>Fixed/continuous/wheel</td>
<td>Fixed/continuous/wheel</td>
</tr>
<tr>
<td>LED lighter</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FRnet ( High speed I/O)</td>
<td>12BDI - 128DO</td>
<td>12BDI - 128DO</td>
</tr>
</tbody>
</table>

Terminal Board selection Information:

<table>
<thead>
<tr>
<th>Name/Function</th>
<th>Function Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN-8237G</td>
<td>For General purpose</td>
</tr>
<tr>
<td>DN-8468G</td>
<td>For Mitsubishi Servo Amplifier</td>
</tr>
<tr>
<td>DN-8468M</td>
<td>For Mitsubishi Servo Amplifier</td>
</tr>
<tr>
<td>DN-8468Y</td>
<td>For Yaskawa Servo Amplifier</td>
</tr>
<tr>
<td>DN-8237D</td>
<td>For Delta Servo Amplifier</td>
</tr>
</tbody>
</table>

Motion Controller selection Information:

<table>
<thead>
<tr>
<th>WinCon-8000 selection Information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-8031</td>
</tr>
<tr>
<td>W-6331</td>
</tr>
<tr>
<td>W-8731</td>
</tr>
<tr>
<td>W-8041</td>
</tr>
<tr>
<td>W-8341</td>
</tr>
<tr>
<td>W-8741</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I-8000 selection Information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-8411</td>
</tr>
<tr>
<td>I-8811</td>
</tr>
<tr>
<td>I-8431</td>
</tr>
<tr>
<td>I-8831</td>
</tr>
<tr>
<td>I-8431-80</td>
</tr>
<tr>
<td>I-8831-80</td>
</tr>
</tbody>
</table>