I-8196F / I-9196F

High-speed, DSP-based, 6-axis Motion Control Module with FRnet Master

Features:

- Expansion card for ICPDAS programmable automation controller (PAC)
- DSP-based motion control module
- Maximum pulse output frequency: 4 MHz
- Maximum Encoder input frequency: 12 MHz
- Independent 6-axis motion control
- 2- to 6-axis linear/ 2- to 3-axis circular/ helical interpolation function
- Continuous interpolation
- 4-step home mode with auto-searching
- Synchronized start motion
- Programmable T/S-curve acceleration and deceleration
- Software limit protection
- Software FIFO for arbitrary curve motion
- High-speed position latch
- High-speed compare trigger and auto-increment compare mode
- Expandable remote I/O: 128 DI and 128 DO via a two-wire FRnet interface.

Introduction:

The I-8196F and I-9196F are 6-axis stepping/ pulse-type servo motor control modules. Both modules are expansion units for the programmable automation controller (PAC) series provided by ICPDAS. The I-8196F module is an expansion card for the XP-8000 and WP-8000 series. The I-9196F module is a plug-in card for the XP-9000 and WP-9000 series.

A digital signal processor (DSP) calculates the commanded move trajectory and manages supervisory control by monitoring the limits and emergency stops to ensure safe operation. I/O control output (e.g. latch, compare, encoder counter etc.) is realized in a Field Programmable Gate Array (FPGA).

The motion controller is suitable for general-purpose motion control applications. In additions to its wide speed range, this intelligent motion controller also has a variety of built-in motion control functions, such as 2- to 6-axis linear interpolation, 2- and 3-axis circular interpolation, helical interpolation, T/S-curve acceleration/deceleration, and automatic home search, etc.

The motion controller uses FRnet as a communication protocol to control distributed remote I/O modules. In an FRnet network the motion controller acts as a master and can control up to 128 digital outputs and 128 digital inputs. The FRnet scan interval is 0.72 ms. FRnet is a two-wire serial bus and is specifically designed for easy and cost effective wiring. ICPDAS provides a large range of FRnet I/O terminal boards and modules.

Libraries and DLL are provided for the following operation systems: Windows embedded, WinCE 5.0 and 6.0. A software utility enables the user to initialize the motion controller and execute motion commands.

Specifications:

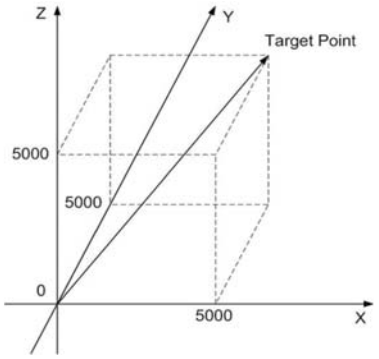
Number of Axes	6
Maximum Pulse Output Rate	4 MHz
Command Type	Pulse command
Pulse Output Mode	CW/CCW, PULSE/DIR, A/B pulse
Linear Interpolation	Any 2- to 6-axis
Circular/Helical Interpolation	Any 2- or 3-axis
Speed Curve Profile	T/S-curve
Mechanical Switch Input	Home, LMT+/-, NHOME, LTC, EMG
Servo I/O Interface	Input: INP, ALM, RDY Output: SVON, ALM_RST, ERC
Ring Counter Mode	32-bit
Position Control Mode	Relative and absolute position
Position Compare Trigger	4 MHz
Encoder Interface	A/B pulse, Up/Down
Encoder Counter	32-bit
Maximum Encoder Counting Rate	12 MHz
Digital Input Channels	Local: 12 DI Expandable: 128 DI
Digital Output Channels	Local: 3 DO Expandable: 128 DO
I/O Isolation (with DN-8368)	2500 Vrms optical isolation
Connector	68-pin VHDCI connector and 20-pin SCSI-II
Power Consumption	+5 V @ 500 mA
Environmental	
Operating Temperature	0 ~ +60 °C
Storage Temperature	-20 ~ +80 °C
Ambient Relative Humidity	5 ~ 90 % RH, non-condensing

Software Support:

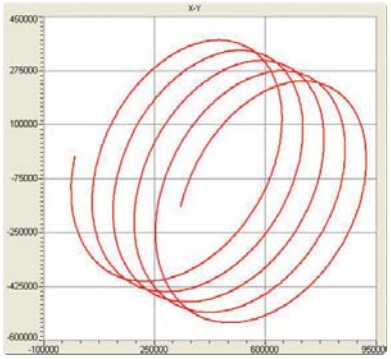
WES WinCE	32 bit: Visual C++ lib/DLL C#, VB.Net LabVIEW Configuration utility Demo programs

Features of Motion Function:

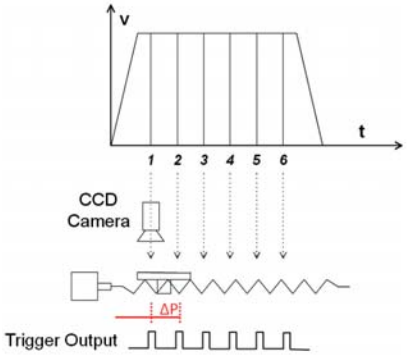
2 to 6-Axis Linear Interpolation



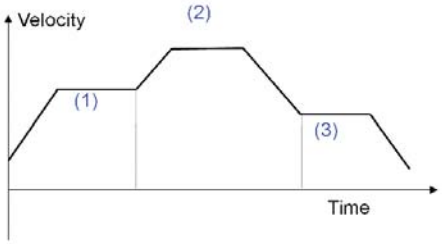
3-Axis Circular or Helical Interpolation



High Speed Position Compare

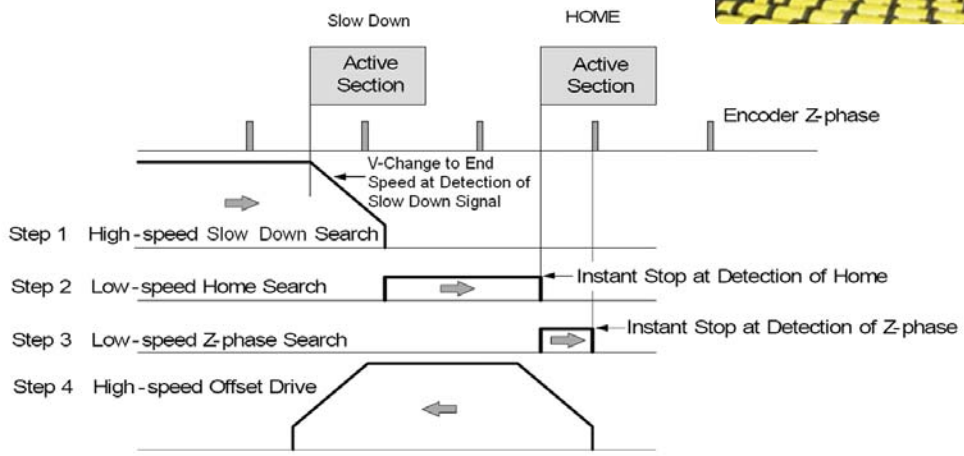


Multi-Axis Continuous Interpolation (With Acc. and Dec.)



Huge Command Buffer and Real Time Coordinate Transformation Suitable for Robotic Control

4 Steps Automatic Home Searching



Ordering Information/Accessories:

Model No.	Description
I-8196F	**High-Speed 6-axis Motion Control Module with FRnet Master (For XP-8000/WP-8000 PAC)**
I-9196F	**High-Speed 6-axis Motion Control Module with FRnet Master (For XP-9000/WP-9000 PAC)**
DN-8368UB	Photo-isolated Universal Snap-on wiring terminal board
DN-8368GB	Photo-isolated General-purpose wiring terminal board
DN-8368MB	Photo-isolated Snap-on wiring terminal board for Mitsubishi MELSERVO-J2 servo amplifier
DN-20M	General purpose digital input and remote digital I\O (FRnet) extension board
CA-MINI68-15	68-pin VHDCI to SCSI-II Connector Cable, Length 1.5 M
CA-SCSI20-M1/M3/M5	20-pin SCSI-II Male connector cable (for Mitsubishi J2 series motor), Length 1 M / 3 M / 5 M.
CA-26-MJ3-15/30/50	26-pin HD D-Sub Male Cable for Mitsubishi Servo Amplifier, 1.5/3/5 M. (for MELSERVO-J3/J4 Series)
CA-26-PA4-15/30/50	26-pin HD D-Sub Male Cable for Panasonic Servo Amplifier, 1.5/3/5 M. (for MINAS A4/A5 Series)
CA-26-YSV-15/30/50	26-pin HD D-Sub Male Cable for Yaskawa Servo Amplifier, 1.5/3/5 M. (for Sigma II/III/V Series)
CA-26-TTA-15/30/50	26-pin HD D-Sub Male Cable for Teco Servo Amplifier, 1.5/3/5 M. (for TSTA-A/A+ Series)
CA-26-DAA2-15/30/50	26-pin HD D-Sub Male Cable for Delta A2 Servo Amplifier, 1.5/3/5 M. (for ASDA-A2 Series)
CA-26-DAB2-15/30/50	26-pin HD D-Sub Male Cable for Delta B2 Servo Amplifier, 1.5/3/5 M. (for ASDA-B2 Series)
CA-26-FFW-15/30/50	26-pin HD D-Sub Male Cable for Fuji Servo Amplifier, 1.5/3/5 M. (for FALDIC-W and ALPHA5 Smart Series)