I-8196F/I-9196F

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

Features

- Expansion card for ICP DAS PAC (programmable automation controller)
- DSP-based motion control module
- Pulse Output Rate: 4 MHz (Max.)
- 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 ICP DAS. The I-**8**196F module is an expansion card for the XP-8000 and WP-8000 series. The I-**9**196F 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.

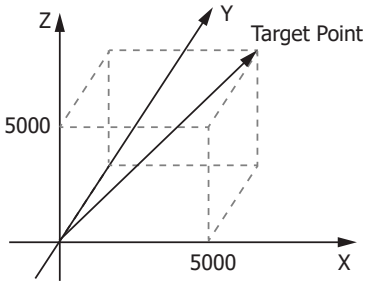
In additions to its wide speed range, this intelligent motion controller also has a variety of built-in motion control functions, such as 2- to 6-axis linear interpolation, 2- and 3-axis circular interpolation, helical interpolation, T/S-curve acceleration/deceleration, and automatic home search, etc.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

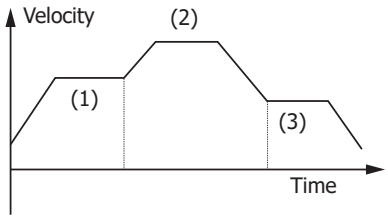
Model	I-8196F	I-9196F
Software		
Development	Visual C++ lib/DLL C#, VB.Net DLL, Visual Basic 6.0	
Utility	EzGo Utility	
Hardware		
Connector	68-pin VHDCI connector and 20-pin SCSI-II	
General		
No. of Axes	6	
Speed Profile	T/S-curve	
Servo Update Rate	2 KHz	
Position Control Mode	Relative and absolute position	
Command Type	Pulse command	
Auto-Home Search	Yes	
Input Signal Filter	Yes	
Axis I/O		
Servo Interface Output	SVON, ALM_RST, ERC	
Latch Input	High-Speed 5 V or 24 V NPN	
Mechanical Switch Input	Home, LMT+/-, NHOME, EMG	
Position Compare Output	High-Speed 5 V TTL or 24 V open collector	
Servo Interface Input	INP、ALM、RDY	
Encoder Input		
Ring Counter Mode	32-bit	

Model	I-8196F	I-9196F
Mode	A/B Phase, Up/Down	
Counting Rate	12 MHz (Max.)	
Counter Width	32-bit	
Pulse Output		
Mode	CW/CCW, PULSE/DIR, A/B Phase	
Rate	4 MHz (Max.)	
Interpolation		
Cicular	Any 2 axes	
Continuous	Yes	
Helical	Any 3-axis	
Linear	Any 2- to 6-axis	
Digital Input		
Channels	Local: 12 DI, Expandable: 128 DI	
Isolation (with DN-8468)	2500 Vrms optical isolation	
Digital Output		
Channels	Local: 3 DO, Expandable: 128 DO	
Isolation (with DN-8468)	2500 Vrms optical isolation	
Power		
Consumption	+5 V @ 500 mA	
Environment		
Operating Temperature	0 ~ +60 °C	
Storage Temperature	-20 ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

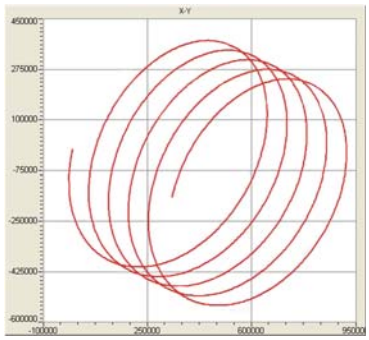
Features of Motion Function



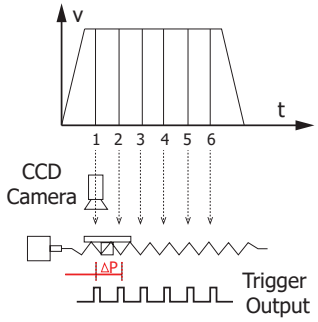
2 to 6-Axis Linear Interpolation



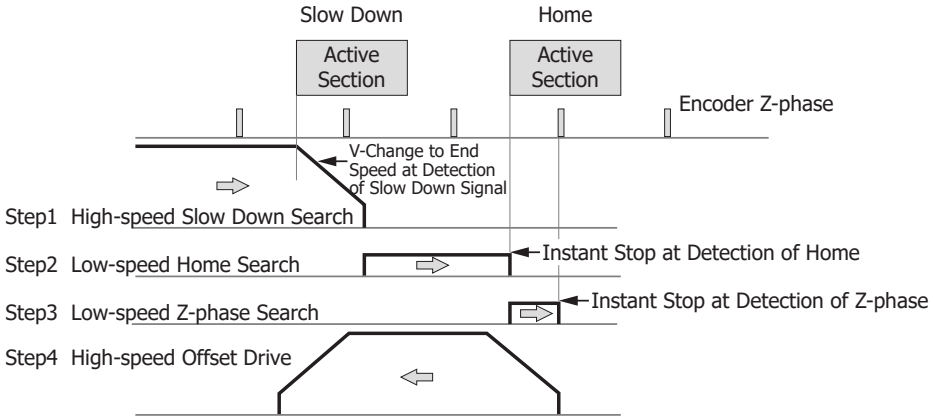
Multi-Axis Continuous Interpolation
(With Acc. and Dec.)



3-Axis Circular or Helical Interpolation



High Speed Position Compare



4 Steps Automatic Home Searching

Ordering Information

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)

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

Accessories

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(B)	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(B)	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(B)	26-pin HD D-Sub Male Cable for Yaskawa Servo Amplifier, 1.5/3/5 M. (for Sigma II/III/V Series)
CA-26-DAA2-15/30/50(B)	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(B)	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)
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)