Apter Power

Chapter 8 Option Modules

This chapter provides an overview of Series 90-30 Option modules. For detailed information, the applicable user's manual should be consulted (these manuals are listed for each module at the end of its section).

Third-Party Option Modules and the Accompany Program

In addition to the modules discussed in this chapter, numerous third-party option modules (and other hardware and software products) for the Series 90-30 PLC are available to meet a wide variety of needs. Third-party companies that meet GE Fanuc's standards may apply for recognition under the GE Fanuc Accompany Program. Details on the Accompany Program are found in the GE Fanuc Automation Solutions Catalog or on the GE Fanuc web site, both listed below. For information on third-party modules, consult the following:

- Your GE Fanuc PLC distributor or sales engineer
- The GE Fanuc web site at *http://www.gefanuc.com*
- The GE Fanuc *Automation Solutions Catalog*, GFW-0067

Option Modules Discussed in this Chapter

- IC693CMM301 Genius Communications Module (GCM)
- IC693CMM302 Enhanced Genius Communications Module (GCM+)
- IC693BEM331 Genius Bus Controller (GBC)
- IC693BEM340 FIP Bus Controller (FBC)
- IC693BEM330 FIP Remote I/O Scanner
- IC693APU301/302 Motion Mate Axis Positioning Module (APM)
- IC693DSM302 Motion Mate Digital Servo Module (DSM302)
- IC693DSM314 Motion Mate Digital Servo Module (DSM314) – Preliminary
- IC693APU300 High Speed Counter (HSC) Module
- IC693BEM320 I/O Link Interface Module
- IC693BEM321 I/O Link Master Module
- IC693APU305 I/O Processor Module
- IC693CMM321 Ethernet Interface Module
- IC693PCM300/301/311 Programmable Coprocessor Module (PCM)
- IC693CMM311 Communications Control Module (CCM)
- IC693ADC311 Alphanumeric Display Coprocessor (ADC) Module
- IC693TCM302 Temperature Control Module (TCM)
- IC693PTM100 Power Transducer Module (PTM) –Preliminary

IC693DSM302 Motion Mate Digital Servo Module (DSM302)

The Motion Mate DSM302 is a high-performance, 2-axis motion control module that is highly integrated with the logic solving and communications functions of the Series 90-30 PLC. In digital mode, this module controls GE Fanuc digital servos. Beginning with the release of Firmware 1.40, this module was provided with the capability of controlling servos with an analog command input, such as the GE Fanuc SL Series Servos, or third party analog servos.

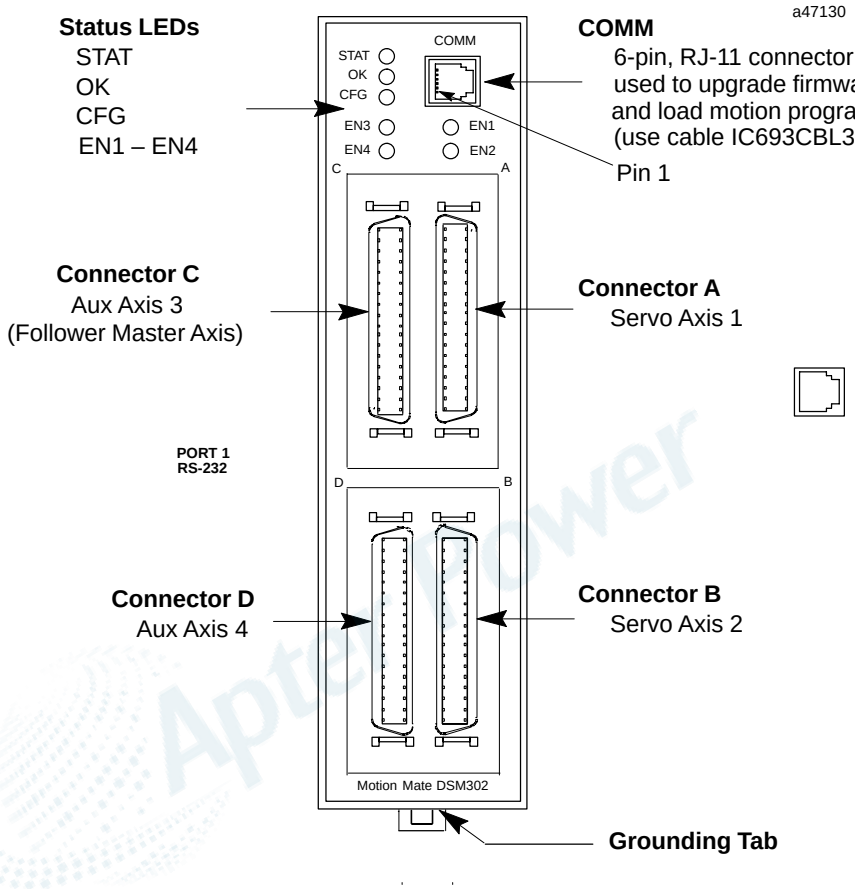

Figure 8-12. Motion Mate DSM302 Module

Features.

- Digital Signal Processor (DSP) control of GE Fanuc Servos
- Block Processing time under 5 milliseconds
- Velocity Feed forward and Position Error Integrator to enhance tracking accuracy
- High resolution of programming units
  - Position: -8,388,608...+8,388,607 User Units
  - Velocity: 1 ... 8,388,607 User Units / sec
  - Acceleration: 1 .. 134,217,727 User Units / sec / sec
- Simple and powerful Motion Program instruction set
- Simple 1- or 2-axis motion programs with synchronized block start
- Program support for a short motion program, called Program 0, which can be created in Logicmaster 90-30 / 20 / Micro configuration software
- Non-volatile storage for 10 programs and 40 subroutines, created with the APM Motion Programming software.
- User scaling of programming units (User Units)
- DSM firmware, stored in Flash memory, is updated via its front panel COMM port.
- Generic programming using command parameters as operands for Acceleration, Velocity, Move, and Dwell Commands
- Configured with Logicmaster 90-30 / 20 / Micro software (version 8.02 or later)
- Automatic Data Transfer between PLC tables and DSM302 without user programming
- Ease of I / O connection with factory cables and terminal blocks as well as a serial port for connecting programming devices. The serial port also allows "soft" upgrades to firmware, which is stored in Flash memory.
- Control of GE Fanuc Digital servos, analog SL Series Servos, or third party analog servos.
- Home and overtravel switch inputs for each Servo Axis
- Two Position Capture Strobe Inputs for each Position Feedback Input
- 5v , 24v and analog I / O for use by PLC
- A Quad B Encoder input for Follower Master axis
- 13 bit Analog Output can be controlled by PLC or used as Servo Tuning monitor

Configuration

The DSM302 is configured using Logicmaster 90-30 or VersaPro software . The DSM302 is assigned to a particular slot and rack like any other PLC module. In addition, other types of configuration data must be entered such as:

- I/O addresses where the CPU to DSM302 data transfers take place
- Serial Port Setup (COMM on module's front panel) for connecting the APM Motion Programmer
- DSM302 Setup Data
- A small optional motion program, Program Zero (20 lines in standard mode, 9 lines in follower mode)

Modes of Operation

Standard Mode

In *Standard* mode, the module provides closed loop position and velocity control for one or two servo motors. User Programming units can be adjusted by configuring a User Units to Feedback Counts ratio. *Jog*, *Move at Velocity* and *Execute Motion Program* commands allow Standard mode to be used in a wide variety of positioning applications.

Follower Mode

In *Follower* mode, the module provides most of the same features as Standard mode with a major exception that the User Units to Counts ratio is not configurable. This ratio is fixed at 1:1 in Follower mode. In Follower mode, a Master Axis position input can be enabled. Each Follower axis tracks the Master Axis input at a programmable A:B ratio. Motion caused by *Jog, Move at Velocity* and *Execute Motion Program* commands can be combined with follower motion generated by the master axis. Follower options include:

- Selection of internal or external Master Axis sources
- Acceleration Ramp to smoothly accelerate a slave axis until its position and velocity lock to the master / slave A:B ratio
- Winder mode ("electronic fishing reel") for coil winding and material handling applications

IC693DSM302 Documentation

- GFK-1464, *Motion Mate DSM302 for Series 90-30PLCs User's Manual.*
- GFK-0664, *Series 90-30 PLC APM Programmer's Manual*

Related servo manuals:

- GFK-1581, *SL Series Servo User's Manual*
- GFH-001, *Beta Series Servo Products Specification Guide*
- GFZ-65192EN, *Alpha Series Servo Amplifier (SVU) Descriptions Manual*
- GFZ-65162E, *Control Motor Amplifier, Alpha Series*
- GFZ-65142E, GFZ-65150E, GFZ-65165E, *Alpha Series Servo Motor Manuals*

IC693CBL311	10' (3 meter) APM I/O cable connects between one of the 24-pin connectors on the module and the connector on the terminal block. **Two cables are required per module.**	APM modules: IC693APU301 IC693APU302
IC693CBL312	0.5' (152 mm) I/O expansion cable interconnects baseplate expansion ports. This is a Wye type cable for daisy-chaining baseplates.	To interconnect CPU, expansion, and remote baseplates.
IC693CBL313	26' (8 meter) I/O expansion cable interconnects baseplate expansion ports. This is a Wye type cable for daisy-chaining baseplates.	To interconnect CPU, expansion, and remote baseplates.
IC693CBL314 **Note: This cable is identical to cable IC693CBL302**	50' (15 meter) I/O expansion cable interconnects baseplate expansion ports. This is a special type with built-in termination resistors. It is not a Wye type cable - it is for use as the last cable on the link.	To interconnect CPU, expansion, and remote baseplates.
IC693CBL315 **(Obsolete. Use IC693CBL327 and IC693CBL328)**	10' (3 meter) I/O cable connects to one of the 24-pin connectors on the module. The other end has stripped, tinned, and labeled leads. **Two cables are required per module.**	For High Density (32-point) I/O modules having dual 24-pin connectors: IC693MDL654 IC693MDL655 IC693MDL752 IC693MDL753
IC693CBL316	3' (1 meter) serial cable with 9-pin D-shell connector that connects to a Personal Computer's serial port. The other end has an RJ-11 connector.	For connecting to modules with an RJ-11 communications port: IC693CMM321 IC693CPU351, 352, 363 IC693DSM302, 314
IC693CBL317	Special 10' (3 meter) APM I/O cable connects between one of the 24-pin connectors on the module and the connector on the terminal block. This cable is similar to IC693CBL311 except that its drain shield wire is brought outside of the connector. **Two cables are required per module.**	APM modules: IC693APU301 IC693APU302s
IC693CBL318	Unused or inactive number	

IC693CBL319	3' (1 meter) APM I/O cable connects between one of the 24-pin connectors on the module and the connector on the terminal block. **Two cables are required per module.**	APM modules: IC693APU301 IC693APU302
IC693CBL320	Special 3' (1 meter) APM I/O cable connects between one of the 24-pin connectors on the module and the connector on the terminal block. This cable is similar to IC693CBL319 except that its drain shield wire is brought outside of the connector. **Two cables are required per module.**	APM modules: IC693APU301 IC693APU302
IC693CBL321 **(Obsolete. Use IC693CBL329 and IC693CBL330)**	3' (1 meter) I/O cable connects between a 24-pin connector on the module and the connector on the terminal block.	Used with the Terminal Block Quick Connect assemblies. See Appendix J for a module list and cable selection information.
IC693CBL322 **(Obsolete. Use IC693CBL331 and IC693CBL332)**	6' (2 meter) I/O cable connects between a 24-pin connector on the module and the connector on the terminal block.	Used with the Terminal Block Quick Connect assemblies. See Appendix J for a module list and cable selection information.
IC693CBL323 **(Obsolete. Use IC693CBL333 and IC693CBL334)**	1.5' (0.5 meter) I/O cable connects between a 24-pin connector on the module and the connector on the terminal block.	Used with the Terminal Block Quick Connect assemblies. See Appendix J for a module list and cable selection information.
IC693CBL324	3' (1 meter) cable connects between a DSM module and either a servos axis terminal block or an aux axis terminal block. See the DSM user's manuals (GFK-1464, GFK-1742) for details.	DSM modules: IC693DSM302 IC693DSM314
IC693CBL325	10' (3 meter) cable connects between a DSM module and either a servo axis terminal block or an aux axis terminal block. See the DSM user's manuals (GFK-1464, GFK-1742) for details.	DSM modules: IC693DSM302 IC693DSM314
IC693CBL326	Unused or inactive number	

IC693CBL334	20” (0.5 meter) right angle I / O cable connects between the right 24-pin connector on a 32-point module or the single connector on a TBQC faceplate and the connector on the terminal block. **Replaces cable IC693CBL323.**	Used with the Terminal Block Quick Connect (TBQC) assemblies. See Appendix J for a module list and cable selection information.
IC693CBL340	PTM interface cable. 19” (0.45 meter) length. Connects between PTMPM Series 90-30 PLC module and the PTMIM DIN-rail mounted interface module.	Part of IC693PTM100 assembly. This assembly includes PTMPM module, PTMIM interface module, and IC693CBL340 cable. This cable also available as separate item.
IC693CBL341	PTM interface cable. 39” (1 meter) length. Connects between PTMPM Series 90-30 PLC module and the PTMIM DIN-rail mounted interface module.	Part of IC693PTM101 assembly. This assembly includes PTMPM module, PTMIM interface module, and IC693CBL341 cable. This cable also available as separate item.
IC693CBL803	3’ (1 meter) redundant communications cable.	
IC800CBL001	3’ (1 meter) Digital Servo Command cable connects between a DSM module and either a digital servo amplifier or a digital servo axis terminal block. See the DSM user’s manuals (GFK-1464, GFK-1742) for details.	Used with DSM modules: IC693DSM302 IC693DSM314
IC800CBL002	10’ (3 meter) Digital Servo Command cable connects between a DSM module and either a digital servo amplifier or a digital servo axis terminal block. See the DSM user’s manuals (GFK-1464, GFK-1742) for details.	Used with DSM modules: IC693DSM302 IC693DSM314d