MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GALIL

DMC-2240

FOUR-AXIS ETHERNET MOTION CONTROLLER

Used with the applicable DMC-22x0 Optima configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Galil DMC-2240

Ethernet/RS232 & USB/RS232 Optima 1–8 axes

DMC-20x0 and DMC-22x0 Series

Product Description

The DMC-20x0 and DMC-22x0 Series are box-level, multi-axis controllers designed for stand-alone applications. The controllers differ only in their type of communication interface: the DMC-20x0 has USB and the DMC-22x0 has an Ethernet 10/100Base-T port. The controllers also include two RS232 serial ports. The DMC-20x0 and DMC-22x0 controllers are available for 1 through 8 axes.

The DMC-2xx0 controllers incorporate a 32-bit microcomputer and provide such advanced features as PID compensation with velocity and acceleration feedforward, programmable notch filter, program memory with multitasking for simultaneously running up to eight application programs, and uncommitted I/O for synchronizing motion with external events. They handle various modes of motion including point-to-point positioning, jogging, linear and circular interpolation, contouring, electronic gearing and ECAM. Additionally, the controllers are user-configurable for stepper or servo motor control on any combination of axes.

DMC-22x0 Stand-alone with Ethernet/RS232



Like all Galil controllers, the DMC-2xx0 controllers use a simple, English-like command language which makes them very easy to program. Galil's WSDK servo design software further simplifies system set-up with "one-button" servo tuning and real-time display of position and velocity information. Communication drivers are available for DOS, Linux and all current Windows operating systems.

Features

- *Box-level, stand-alone motion controllers*
- *Available in 1 through 8 axis versions: where x=1,2,3,4,5,6,7,8 axes*
- *Two RS232/422 ports up to 115 kbaud*
- *DMC-20x0: USB*
  DMC-22x0: Ethernet 10/100 Base-T
- *Ethernet supports multiple masters and slaves. TCP/IP, UDP and ModBus TCP master protocol for communication with I/O*
- *User-configurable for stepper or servo motors on any combination of axes. Optional firmware for piezo-ceramic motors. Sinusoidal commutation for brushless servo motors*
- *12 MHz encoder frequencies for servos; 3 MHz for steppers*
- *PID compensation with velocity and acceleration feedforward, integrator limit, notch filter and low-pass filter*
- *Modes of motion include jogging, point-to-point positioning, contouring, linear and circular interpolation, electronic gearing and ECAM. Features ellipse scaling, slow-down around corners, infinite segment feed and feedrate override*
- *Over 200 English-like commands directly executable by controller. Includes conditional statements and event triggers*
- *Non-volatile memory for programs, variables and arrays. Concurrent execution of up to eight application programs*
- *Dual encoders, isolated home and limits for each axis*
- *8 optoisolated uncommitted inputs and 8 outputs for 1- through 4-axis models, 16 in/16 out for 5- through 8-axis models*
- *High speed position latch for each axis and output compare*
- *8 uncommitted analog inputs*
- *Additional 64 configurable digital I/O*
- *Use Galil's IOC-7007 I/O controller for additional I/O*
- *100-pin SCSI connectors for each set of 4 axes. Galil's ICM-2900 interconnect module breaks-out 100-pin cable into screw terminals and attaches directly to DMC-2xx0 metal enclosure*
- *12.1" x 2.2" x 6.3" metal enclosure; Accepts 90-250V AC*
- *CE certified*
- *Custom hardware and firmware options available*

Ethernet/RS232 and USB/RS232 Optima 1–8 axes

DMC-20x0 and DMC-22x0 Series

Specifications

System Processor

- Motorola 32-bit microcomputer

Communications Interface

- DMC-2000: USB 1.1 or 12.5 Mb/sec, expansion hub with two ports. (2) RS232/422 ports up to 115 kb. RS485 option
- DMC-2200: Ethernet 10/100BASE-T. (2) RS232/422 ports up to 115 kb. RS485 option

Commands are sent in ASCII. A binary communication mode is also available as a standard feature

Modes of Motion:

- Point-to-point positioning
- Position Tracking
- Jogging
- 2D Linear and Circular Interpolation with feedrate override
- Linear Interpolation for up to 8 axes
- Tangential Following
- Helical
- Electronic Gearing with multiple masters
- Gantry Mode
- Electronic Cam
- Contouring
- Teach and playback

Memory

- Program memory size — 1000 lines × 80 characters
- 510 variables
- 8000 array elements in up to 30 arrays

Filter

- PID (proportional-integral-derivative) with velocity and acceleration feedforward
- Notch filter and low-pass filter
- Dual-loop control for backlash compensation
- Velocity smoothing to minimize jerk
- Integration limit
- Torque limit
- Offset adjustments
- Option for piezo-ceramic motors

Kinematic Ranges

- Position: 32 bit (±2.15 billion counts per move; automatic rollover; no limit in jog or vector modes)
- Velocity: Up to 12 million counts/sec for servo motors
- Acceleration: Up to 67 million counts/sec^2

Uncommitted Digital I/O

	DIGITAL INPUTS	DIGITAL OUTPUTS	CONFIGURABLE I/O
DMC-2x10 thru -2x40	8	8	64
DMC-2x50 thru -2x80	16	16	64

Uncommitted Analog Inputs

- 8 individual ±10 V analog inputs with 12-bit resolution (16-bit available as an option)

High Speed Position Latch

- Uncommitted inputs 1–4 latch X,Y,Z,W, and 9–12 latch E, F, G, H axes (latches within 40 microseconds with optoisolation)

Dedicated Inputs (per axis)

- Main encoder inputs — Channel A, A-, B,B-,I, I- (±12 V or TTL)
- Auxiliary encoder (for axes configured as servo) — Channel A, A-, B, B-
- Forward and reverse limit inputs — optoisolated
- Home input — optoisolated
- Selectable high-speed position latch input — optoisolated
- Selectable abort input — optoisolated

Dedicated Outputs (per axis)

- Analog motor command output with 16-bit DAC resolution
- Pulse and direction output for step motors
- PWM output also available for servo amplifiers
- Amplifier enable output
- Error output (one per controller)
- High-speed position compare output (1 output for each set of 4 axes)

Minimum Servo Loop Update Time

	-FAST†
1–2 axes: 250 µsec	125 µsec
3–4 axes: 375 µsec	250 µsec
5–6 axes: 500 µsec	375 µsec
7–8 axes: 625 µsec	500 µsec

Maximum Encoder Feedback Rate

- 12 MHz

Maximum Stepper Rate

- 3 MHz (Full, half or microstep)

Power Requirements

- *DMC-2xx0 series: accepts 90–250 V AC, 50–60 Hz*

Environmental

- Operating temperature: 0–70° C for card; 0–60° for box
- Humidity: 20–95% RH, non-condensing

Mechanical

- DMC-2xx0 series: 1–8 axes, 12.1" × 2.2" × 6.3" metal enclosure

†*Reduced feature set for -FAST.*

Ethernet/RS232 and USB/RS232 Optima 1–8 axes

DMC-20x0 and DMC-22x0 Series

Ordering Information

PART NUMBER	DESCRIPTION	QUANTITY 1	QUANTITY 100
DMC-2010 (or 2210)	1-axis USB, RS232 (or 1-axis Ethernet 10/100BASE-T, RS232)	$1595	$ 995
DMC-2020 (or 2220)	2-axis USB, RS232 (or 2-axis Ethernet 10/100BASE-T, RS232)	$1995	$1145
DMC-2030 (or 2230)	3-axis USB, RS232 (or 3-axis Ethernet 10/100BASE-T, RS232)	$2395	$1195
DMC-2040 (or 2240)	4-axis USB, RS232 (or 4-axis Ethernet 10/100BASE-T, RS232)	$2595	$1295
DMC-2050 (or 2250)	5-axis USB, RS232 (or 5-axis Ethernet 10/100BASE-T, RS232)	$2895	$1445
DMC-2060 (or 2260)	6-axis USB, RS232 (or 6-axis Ethernet 10/100BASE-T, RS232)	$3095	$1545
DMC-2070 (or 2270)	7-axis USB, RS232 (or 7-axis Ethernet 10/100BASE-T, RS232)	$3295	$1645
DMC-2080 (or 2280)	8-axis USB, RS232 (or 8-axis Ethernet 10/100BASE-T, RS232)	$3495	$1745
FIBEROPTIC	Ethernet 10/100BASE-F, RS232 fiberoptic link	$ 200	$ 150
ICM-2900	Interconnect module (use 1 for every 4 axes). Specify -HAEN for high amp enable or -LAEN for low amp enable. Specify -FL for flange	$ 295	$ 195
ICM-2900-OPTO	ICM with optoisolated outputs	$ 345	$ 245
ICM-2908	Interconnect module for auxiliary encoders	$ 125	$ 95
TERM-P	Panel-mount terminal	$ 945	$ 765
CABLE-USB-2M	USB cable, 2 meter	$ 10	$ 10
CABLE-USB-3M	USB cable, 3 meter	$ 15	$ 15
CABLE-9-pin D	RS232 cable	$ 10	$ 10
CABLE-100-1M	100-pin high-density cable in 1 meter length	$ 125	$ 95
CABLE-100-2M	100-pin high-density cable in 2-meter length	$ 135	$ 100
CABLE-100-4M	100-pin high-density cable in 4 meter length	$ 150	$ 105
CABLE-36-1M	36-pin high-density cable in 1 meter length (for aux encoders)	$ 90	$ 75
CABLE-36-3M	36-pin high-density cable in 3 meter length (for aux encoders)	$ 110	$ 90
CABLE-80-1M	80-pin high-density cable in 1 meter length (for extended I/O)	$ 125	$ 95
CABLE-80-4M	80-pin high-density cable in 4 meter length (for extended I/O)	$ 150	$ 105
IOM-1964	Input/Output optoisolated module for 64 I/O	$ 695	$ 495
AMP-19520	2-axis amplifier for 500 W servos	$ 595	$ 395
AMP-19540	4-axis amplifier for 500 W servos	$ 795	$ 495
-SR	Shunt regulator option for AMP-195x0	$ 50	$ 25
Galil Utilities	Communication drivers, SmartTERM, DMCDOS	$ 20 for CD; free download	
WSDK	Set-up, tuning and analysis software	$ 195	
ActiveX Tool Kit	Custom ActiveX controls for Visual Basic, Visual C++, etc.	$ 595	

Galil offers additional quantity discounts for purchases between 1 and 100. Consult Galil for a quotation.