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Find the *Galil Motion Control DMC-1740* at our website: *Click HERE*

# PC/104, ISA, PCI Optima 1–8 axes

## DMC-12x0, DMC-17x0, DMC-18x0 Series

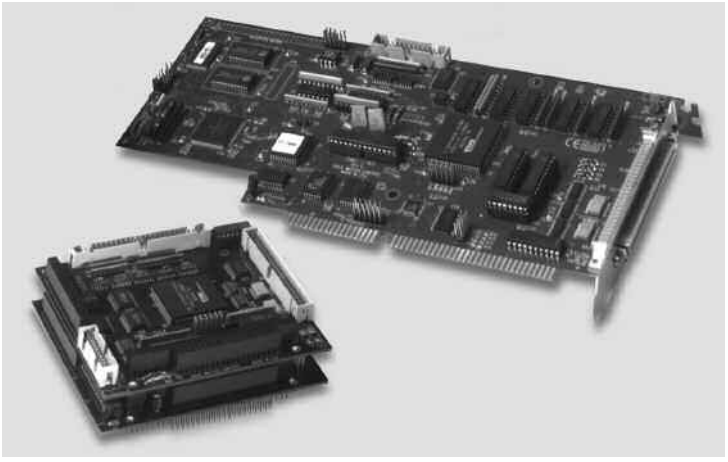
### Product Description

The DMC-12x0, DMC-17x0 and DMC-18x0 are Optima motion controllers which are prior generation. The controllers differ only in their communication interface: DMC-12x0 is for PC/104; DMC-17x0 for ISA bus and DMC-18x0 for PCI. For single axis applications, Galil's Econo, DMC-1411 (PC/104), DMC-1412 (RS232), or DMC-1417 (PCI) controllers should be considered.

The motor controllers incorporate a 32-bit microcomputer and provide such advanced features as PID compensation with velocity and acceleration feedforward, programmable notch, program memory with multitasking for simultaneously running up to eight applications 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.

Like all Galil controllers, the 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.

Top to bottom:
*DMC-17x0 ISA*
*DMC-12x0 PC/104*



### *Features*

- *Available in various communication and axes formats:*
  *DMC-12x0: PC/104 x=1,2,3,4,5,6,7,8 axes*
  *DMC-17x0: ISA x=1,2,3,4,5,6,7,8 axes*
  *DMC-18x0: PCI x=1,2,3,4,5,6,7,8 axes*
- *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, integration limits, 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 elliptical scaling, slow-down around corners, infinite segment feed and feedrate override*
- *Over 200 English-like commands including conditional statements and event triggers*
- *Non-volatile memory for programs, variables and arrays. Concurrent execution of up to eight application programs*
- *Isolated home and forward and reverse limits accepted for every axis. Isolation not available on the DMC-12x0*
- *8 isolated uncommitted inputs and 8 outputs for 1- through 4-axes models, 24 in/16 out for 5- through 8-axis models. Optical isolation not available on the DMC-12x0*
- *High speed position latch for each axis and output compare*
- *8 uncommitted analog inputs*
- *Dual encoder inputs for each axis*
- *Additional 64 I/O may be added on DMC-12x0 and DMC-17x0 using the DB-12064 or DB-14064 daughter board*
- *100-pin SCSI connectors for each set of 4 axes. Galil's ICM-1900 interconnect module breaks-out the 100-pin cable into screw terminals*
- *Communication drivers for all current versions of Windows, DOS, and Linux*
- *CE certified — DMC-17x0 and DMC-18x0*
- *Custom hardware and firmware options available*

# PC/104, ISA, PCI Optima 1–8 axes

## DMC-12x0, DMC-17x0, DMC-18x0 Series

## Specifications

### System Processor

- Motorola 32-bit microcomputer

### Communications Interface

- DMC-12x0: PC/104 with bi-directional, high speed FIFO
- DMC-17xx: ISA with bi-directional FIFO plus auxiliary FIFO
- DMC-18x0: PCI with bi-directional FIFO plus auxiliary FIFO, and DPRAM

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
- 254 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 limits
- Torque limits
- 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-1210 thru -1240* | 8 | 8 | 64 w/ DB-12064 |
| DMC-1250 thru -1280* | 16 | 16 | 64 w/ DB-12064 |
| DMC-1710 thru -1740 | 8 | 8 | 64 w/ DB-14064 |
| DMC-1750 thru -1780 | 24 | 16 | 64 w/ DB-14064 |
| DMC-1810 thru -1840 | 8 | 8 | 64 w/ DB-14064 |
| DMC-1850 thru -1880 | 24 | 16 | 64 w/ DB-14064 |

### 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 0.1 microseconds without optoisolation and within 40 microseconds with optoisolation)

### Dedicated Inputs (per axis)

- Main encoder inputs — Channel A, A-, B,B-,I, I- (±12 V or TTL)
- Dual 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 for servo amplifiers
- Amplifier enable output
- Error output (per card)
- High-speed position compare output (per card)

### Minimum Servo Loop Update Time

| | *STANDARD* | *-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)

** DMC-1200 has TTL limits, home, and general inputs.*

†*Reduced feature set for -FAST.*

OTHER

## Specifications – continued

### *Power Requirements*

+5V 750 mA
-12V 40 mA
+12V 40 mA

### *Environmental*

- Operating temperature: 0–70° C
- Humidity: 20–95% RH, non-condensing

### *Mechanical*

- DMC-12x0
  1–4 axes: 4.4" × 4.15" (2 stacked cards)
  5–8 axes: 4.4" × 4.15" (3 stacked cards)
- DMC-17x0
  1–4 axes: 10.25" × 4.8"
  5–8 axes: 13.25" × 4.8"
- DMC-18x0
  1–4 axes: 8.175" × 4.2"
  5–8 axes: 12.28" × 4.2"

## Hardware Accessories

### *ICM-1900 Interconnect Module*

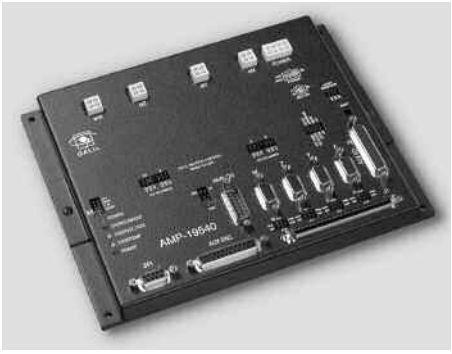
The ICM-1900 Interconnect Module breaks-out the 100-pin main cable and 25-pin auxiliary encoder cable into screw-type terminals for quick connection of system hardware. An ICM-1900 is required for each set of four axes. The ICM-1900 is contained in a metal enclosure with dimensions of 13.5" × 3.0" × 7.0" and 1/4" diameter keyholes for mounting. The ICM is default configured for high amp enable (-HAEN). For low amp enable, order ICM-1900-LAEN. Specify -OPTO for optoisolated outputs.

### *DB-14064 I/O Expansion*

The DB-14064 is an optional board which provides 64 additional I/O for the DMC-17x0, and DMC-18x0 controllers (for the DMC-12x0 use the DB-12064). This board mounts directly onto the back of the controller and provides 64 I/O points configurable by the user as inputs or outputs. The I/O is accessible through two 50-pin IDC headers.

### *AMP-19540 Interconnect with Four 500 Watt Servo Drives*

Galil's AMP-19540 is a 4-axis amplifier for driving brush or brushless motors up to 500 Watts. By interfacing directly to Galil's Optima controllers, it provides a cost-effective controller/drive solution for multi-axis applications. The AMP-19540 contains four transconductance, PWM amplifiers for driving brush or brushless motors. Each amplifier operates at 18 V to 80 V dc, up to 7 Amps continuous, 10 Amps peak. The AMP-19540 gain setting is easily configured with jumpers. The PWM switching frequency is 60 kHz. The AMP-19540 enclosure has dimensions of 6.8" × 8.75" × 1". It interfaces to the Optima controller with a single, 100-pin high density SCSI cable. Signals for each axis are brought out through D-type connectors located on the AMP-19540. For applications with less than three axes, the AMP-19520 two-axis model is available. A shunt regulator option is also available.




*AMP-19540*

### *ICM-2900 Interconnect Module*

The ICM-2900 breaks-out the 100-pin SCSI cable into removable screw-type terminals. One ICM-2900 is required for each set of four axes. The ICM-2900-FL has flanges which allow standard screw-type mounting. Specify -OPTO for optoisolated outputs. Specify -HAEN for high amp enable or -LAEN for low amp enable.

# PC/104, ISA, PCI Optima 1–8 axes

## DMC-12x0, DMC-17x0, DMC-18x0 Series

### Ordering Information

| PART NUMBER | DESCRIPTION |
|---|---|
| **DMC-1210, -1710, -1810** | 1-axis PC/104 or ISA or PCI |
| **DMC-1220, -1720, -1820** | 2-axis PC/104 or ISA or PCI |
| **DMC-1230, -1730, -1830** | 3-axis PC/104 or ISA or PCI |
| **DMC-1240, -1740, -1840** | 4-axis PC/104 or ISA or PCI |
| **DMC-1250, -1750, -1850** | 5-axis PC/104 or ISA or PCI |
| **DMC-1260, -1760, -1860** | 6-axis PC/104 or ISA or PCI |
| **DMC-1270, -1770, -1870** | 7-axis PC/104 or ISA or PCI |
| **DMC-1280, -1780, -1880** | 8-axis PC/104 or ISA or PCI |
| **CB-50-100-1200** | 50-pin to 100-pin converter board which includes two 50-pin cables |
| **CABLE-20-25** | 20-pin IDC to 25-pin D type for dual encoders |
| **CABLE-100-1M** | 100-pin HD cable in 1 meter length |
| **CABLE-100-2M** | 100-pin HD cable in 2-meter length |
| **CABLE-100-4M** | 100-pin HD cable in 4 meter length |
| **CABLESET-1200** | (2) 50-pin ribbon, (1) 20-pin ribbon |
| **ICM-1900** | Interconnect module (use 1 for every 4 axes). Specify -HAEN for high amp enable or -LAEN for low amp enable |
| **ICM-1900-OPTO** | ICM with optoisolated outputs |
| **DB-12064** | Attachment board for 64 additional I/O (use DB-14064 for -17x0 or -18x0) |
| **AMP-19520** | 2-axis amplifier for 500 W servos |
| **AMP-19540** | 4-axis amplifier for 500 W servos |
| **-SR** | Shunt regulator option for AMP-195x0 |

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