



**QUARTERLY NEWSLETTER  
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GALIL MOTION CONTROL**

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“ The mission of Galil’s  
experienced Applications  
Department is to provide  
prompt and accurate technical  
assistance to help OEMs  
successfully deliver their  
products to market. ”

**GALIL SUPPORT TEAM**



# SERVO TRENDS

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Top: DMC-4143-Box 4-axis Motion Controller Packaged with Drives

Bottom: DMC-4143 4-axis Motion Controller Card

## New DMC-41x3 Motion Controller — Higher Performance at Lower Price

### Economical, High-Performance Motion Control

Galil’s newest motion controller, the 5th generation DMC-41x3 was released in the Fall of 2010. It provides higher performance and packaging improvements compared to Galil’s DMC-21x3 controller, without an increase in price. The 4-axis DMC-41x3 card is \$1495 in single quantities (\$995 in quantities of 100) which is 35% less than Galil’s highest performance DMC-4040 Accelera controller. The DMC-41x3 offers OEM design engineers a great option for economical, high performance motion control.

### Higher Speed

Using a powerful RISC processor, performance enhancements of the DMC-41x3 compared to the DMC-21x3 Econo controller include: Ethernet 100Base-T, USB 2.0, faster instruction processing, sampling rate that is twice as fast, higher speed of encoder feedback and twice as much user-program memory, variables and array elements. These enhancements are detailed in **Table 1**.

➤(cont. pg 2)

## Improved Packaging

The DMC-41x3 also provides improvements in hardware design. Unlike the DMC-21x3, the D-type connectors and optical isolation are included on the main processor board which means that a separate ICM interconnect board is not required. In addition, the DC-to-DC converter comes standard on the DMC-41x3 which allows 20 to 80 VDC to be input directly into the controller. The DMC-41x3 also provides eight 12-bit analog inputs as a standard feature.

## More Motor Drive Options

Another improvement of the DMC-41x3 is in the availability of multi-axis motor drives. The drives attach underneath the DMC-41x3 processor board and are mounted directly to the DMC-41x3 metal enclosure for efficient heat dissipation. Any DMC-40x0 or DMC-41x3 series drive can be installed for either the 1st or 2nd set of four axes. The DMC-41x3 metal enclosure which contains both the drive and controller circuit boards is compact and measures 8.1" x 7.25" x 1.5" for the 1-4 axis unit and 11.5" x 7.25" x 1.5" for the 5-8 axis unit. The DMC-41x3 is also available as a card-level product without the enclosure if Galil drives are not used.

The drive boards for the DMC-41x3 are the same ones used for the DMC-40x0 Accelera series and many options are available for stepper and servo motors

including the AMP-43040 4-axis 500W drive for servo motors and the SDM-44140 4-axis micro-stepping drive which operates up to 3A, 60V. Also available are the soon-to-be-released AMP-43540 4-axis servo drive for sinusoidal commutation and the higher-power AMP-43240 4-axis servo drive which operates up to 10A cont, 20 A peak, 20-80 VDC. Low power linear drives for sinusoidal commutation (AMP-43640) and small brush motors (AMP-43140) as well as a low cost stepper drive (SDM-44040) meet the sub-fractional horsepower motor requirement. **Table 2** shows the complete list of multi-axis drives for the DMC-41x3 and DMC-40x0 controllers. The DMC-41x3 controller can also be used with external drives of any power range.

## Many Features

Like Galil's other Econo and Accelera motion controllers, the new DMC-41x3 is available in 1-through 8-axis formats, and each axis is user-configurable for stepper and servo motor operation. Standard features include PID compensation with velocity and acceleration feedforward, memory for user programs, multitasking for simultaneously running up to eight programs, and I/O processing for synchronizing motion with external events. Modes of motion include point-to-point positioning, position tracking, jogging, linear and circular interpolation, contouring, electronic gearing, ECAM, and PVT. Standard isolated inputs include forward and reverse limits for each axis and a

►(cont. pg 3)

**Table 1:** Comparison of DMC-21x3, DMC-41x3, DMC-40x0 Controllers

	DMC-21x3 Econo	DMC-41x3 Econo	DMC-40x0 Accelera
Ethernet	10Base-T	10/100Base-T	10/100Base-T
RS232	Main port, 19.2 kb	Auxiliary port, 19.2 kb	2 ports, 115 kb
USB	None	Yes, Main port	None
Encoder Frequency (Max)	12 MHz	15 MHz	22 MHz
Sample Frequency (Min)	125 microseconds	62 microseconds	31 usec
Program Memory	1000 lines x 80 chr	2000 lines x 80 chr	2000 lines x 80 chr
Array Space	8000 array elements	16000 array elements	16000 array elements
DC-to-DC Converter	Optional	Standard, accepts 20-80 VDC	Standard, accepts 20-80 VDC
Optically Isolated I/O	Isolation requires ICM-20105	Yes, standard	Yes, standard
Current for outputs	500mA, Requires ICM-20105	4mA std, 500mA option	500mA standard
Analog Inputs	Requires DB-28040	Standard	Standard
Interconnect Options	Requires ICM-2010x for D-type connectors	D-type connectors standard	D-type connectors standard
Packaging Options	Card-level	Card-level or Box-level <small>(required if using Galil drives)</small>	Box-level only
Dimensions	4 axis: 4.25" x 7.0" 8 axis: 4.25" x 10.75"	4 axis: 8.1" x 7.25" x 1.5" (Box) 8 axis: 11.5" x 7.25" x 1.5" (Box)	4 axis: 8.1" x 7.25" x 1.72" 8 axis: 11.5" x 7.25" x 1.72"
U.S. Price for 4-axis model	DMC-2143-DC-ICM20105	DMC-4143	DMC-4040
qty 1	\$1490	\$1495	\$2295
qty 100	\$1010	\$ 995	\$1195

home input for each axis. 1-through 4-axis models include 8 isolated, digital inputs and 8 isolated, digital outputs. 5 through 8-axis models include 16 inputs and 16 outputs.

The DMC-41x3 operates stand-alone or interfaces to a PC with Ethernet 10/100Base-T or USB. Like all Galil controllers, the DMC-41x3 controllers are programmed with Galil's intuitive, 2-letter command language, making them easy to program. GalilTools software simplifies system set-up with automated servo tuning and real-time display of motion information.

For complete pricing and specifications for the DMC-41x3 series, please see:  
<http://www.galilmc.com/products/dmc-41x3.php>.

Please contact a Galil applications engineer at 800-377-6329 or [support@galilmc.com](mailto:support@galilmc.com) for more information or to discuss your application. ■

**Table 2:** DMC-41x3 Drive Options

Drive Model	Number of Axes	Motor Type	Specs
AMP-43140	4	Brush servo	Linear 1A; +/-12-30 VDC
AMP-43640	4	Sinusoidal Brushless servo	Linear 1A; 15-30 VDC
AMP-430x0	2 or 4	Brush or Brushless servo	7A cont, 10A peak; 20-80VDC
AMP-43540	4	Sinusoidal Brushless servo	8A cont, 15A peak; 20-80 VDC*
AMP-43240	4	Brush or Brushless servo	10A cont, 20A peak; 20-80 VDC*
SDM-44040	4	Full, half, 1/4, 1/16 stepper	1.4A/phase; 12-30 VDC
SDM-44140	4	1/64 Microstepper	3A/phase; 12-60 VDC

\*Currently in BETA release. Full release in March.

## Galil Announces 750 Watt Servo Drives for DMC-40x0 and DMC-41x3 Controllers

Galil is pleased to introduce the AMP-43240, a 4-axis, higher power servo drive. The new 750 Watt drive operates at 10A continuous, 20A peak at up to 80 VDC per axis. The 4-axis drive resides inside the DMC-4040 Accelera or DMC-4143 Econo 4-axis motion controller enclosure. Two 4-axis drives can be installed in the DMC-4080 or DMC-4183 8-axis controller package. The packaging of the multi-axis drives with the controller saves cost, space and wiring.

The new AMP-43240 provides 50% more power than Galil's AMP-43040 500 Watt drive, making it a good choice to drive larger servo motors. For applications requiring even more power, Galil controllers can be used with external drives of any power range.

The AMP-43240 resides inside the DMC-40x0 or DMC-41x3 enclosure and contains four transconductance, PWM amplifiers for driving brushless or brush-type servo motors. Each amplifier drives motors operating at up to 10 Amps continuous, 20 Amps peak, 20–80 VDC. The gain settings of the amplifier are user-programmable at 0.5 Amp/Volt, 1 Amp/Volt and 2 Amp/Volt. The switching frequency is 24 KHz. The drive operates in chopper mode. The amplifier offers protection for over-voltage, under-voltage, over-current, short-circuit and over-temperature. A shunt regulator option is available.



Galil's AMP-43240 drives are available for shipment now to qualified BETA sites. Full release is scheduled for March 1, 2011. Please see <http://www.galilmc.com/products/dmc-41x3.php> for more information or contact a Galil application engineer at 916-626-0101, [support@galilmc.com](mailto:support@galilmc.com). ■

## Galil. We Move the World.

With over 500,000 controllers installed worldwide, Galil is the leading supplier of motion controllers. Galil's legacy of innovation began in 1983 with the introduction of the first microprocessor-based servo motion controller. Today, Galil continues its leadership by offering the most powerful, cost-effective and easy-to-use controllers to accommodate all your motion and I/O needs.

Galil offers a broad array of motion controllers in a variety of formats: single and multi-axis, card-level and box-level, bus-based and stand-alone. Galil's Ethernet/RS232 and PCI controllers are available in an Econo version for lowest cost and Accelera version for ultra high-speed performance. Plug-in, multi-axis drives for steppers and servos save space, cost and wiring. For intelligent I/O control, the RIO Pocket PLC is compact, low-cost and packed with analog and digital I/O.

At Galil, we share our expertise with our customers. You will find a wealth of information on our website at <http://www.galilmc.com>. Here you can view any of Galil's free web-tutorials, read an application note or white paper, post a question on our bulletin board, or download the latest software and manuals.

Exceptional application support is a top priority at Galil. Call Galil today at 800-377-6329 to discuss your project with one of our highly-trained applications engineers. ■



### ACCELERA CONTROLLERS AND DRIVES

**DMC-40x0** Ethernet/RS232  
**DMC-18x6** PCI

### ECONO CONTROLLERS AND DRIVES

**DMC-41x3** Ethernet/USB/RS232 — **New!**  
**DMC-21x3** Ethernet/RS232  
**DMC-18x2** PCI

### SINGLE-AXIS CONTROLLERS AND DRIVES

**DMC-1415** Ethernet/RS232  
**CDS-3310** Ethernet/RS232

### POCKET PLC I/O CONTROLLER

**RIO-47xxx** Ethernet/RS232

### SOFTWARE TOOLS

**GalilTools.** Servo Tuning and analysis software  
**Ladder Interface.** Converts Ladder program into DMC code for RIO Pocket PLC.  
**Galil PVT.** Software tool for PVT mode of motion.



From top:  
 DMC-40x0 Accelera Controller  
 DMC-21x3 Econo Controller  
 DMC-18x6 PCI Controller  
 RIO Pocket PLC

### FREE Online Support Tools

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