Galil announces the latest advancements to its current generation of multi axis motion controllers, the 1.3 release for the DMC-40x0 and DMC-41x3. This firmware release includes a number of speed enhancements and optimizations in addition to adding support for new hardware and software features that will allow system builders to greatly reduce development time and cost. Getting motors moving and your application to market using a Galil Controller and Amplifiers has never been faster or easier.
Chief among the enhancements included with the 1.3 release, users will immediately notice the dramatic increases to dmc command processing speed. The DMC-40x0 now executes dmc commands 2.5 times faster than on previous firmware revisions while the DMC-41x3 now executes dmc commands at 14 microseconds per command, an incredible 15 times faster than previous firmware revisions. The DMC 40x0 remains Galil’s flagship motion controller with a blistering command processing time of 11 microseconds and a broad variety of standard options to meet the most demanding application requirements.

Ethernet communication speeds have been vastly increased with the 1.3 release, particularly when downloading large dmc programs, arrays and firmware. Both the DMC-40x0 and DMC-41x3 have seen a 10-fold increase in Ethernet data transfer during these transactions, making changing and maintaining large dmc code bases much more responsive. Overall Ethernet communication speed (both TCP and UDP) have received a bump in speed as well. Table 1 shows a side by side comparison of the overall speed gains on the DMC-40x0 and DMC-41x3 with the 1.3 release.

<table>
<thead>
<tr>
<th>Function</th>
<th>DMC-40x0 rev 1.2i</th>
<th>DMC-40x0 rev 1.3a</th>
<th>DMC-41x3 rev 1.2f</th>
<th>DMC-41x3 rev 1.3a</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMC Command Processing</td>
<td>30 µsec</td>
<td>11 µsec</td>
<td>220 µsec</td>
<td>14 µsec</td>
</tr>
<tr>
<td>Full Program Download</td>
<td>30 seconds</td>
<td>2 seconds</td>
<td>30 seconds</td>
<td>2 seconds</td>
</tr>
<tr>
<td>Full Array Download</td>
<td>15 seconds</td>
<td>1.5 seconds</td>
<td>15 seconds</td>
<td>1.5 seconds</td>
</tr>
<tr>
<td>Firmware Download</td>
<td>30 seconds</td>
<td>10 seconds</td>
<td>30 seconds</td>
<td>10 seconds</td>
</tr>
</tbody>
</table>

All DMC-40x0’s and DMC-41x3’s will begin shipping with these improvements starting July 1st, 2018. Upgrading controllers currently in the field to 1.3 requires returning to the factory. Controllers purchased from Galil after April 1st, 2018 are eligible for a no cost upgrade while controllers still under warranty, purchased after January 1st, 2017 can be upgraded for a nominal $125 fee.
Motor Setup Made Easy With New Step-By-Step Tool for GDK

Galil introduces the brand new Step By Step tool for Galil Design Kit. This tool guides users through the setup and configuration of Galil motion controllers that have the 1.3 firmware and the latest hardware revisions. For first time Galil users, this tool will make the initial connection process and motor configuration a breeze.

Taking advantage of new features on the Trapezoidal and Sinusoidal drives, Step By Step Galil will be able to automatically setup brushless motors. This takes a process which previously required the user to rewire motors until the correct configuration was found, and makes it as simple as pressing a few buttons to have GDK perform analysis and phase correction on the motor’s wiring.

(cont. pg 4)
By the end of Step By Step, the user is commanding moves to the controller and creating a backup copy of their setup parameters. This means that for OEM machines any controllers which would require the same setup parameters can be configured almost instantly.
Using the Step By Step tool for controller setup results in a streamlined and straightforward first-time Galil experience, and drastically reduces the time it takes to get motors spinning. This brand new tool will be available July 1st, 2018 as part of the full version of GDK.

Galil Internal Sine Amps: Superb Accuracy and 16 Bit Resolution without Compromise

Galil’s line of digital sine amplifiers have long been the best choice for demanding applications that require precise control at high bandwidths and the ease of use that comes with an integrated motion controller and amplifier package. With the latest revision to these amplifiers, Galil continues to lead the industry with superior current resolution and accuracy.

Galil sine amplifiers are now the only digital servo amplifiers on the market offering full 16 bit PWM current control. In addition, Galil has eliminated the usual frequency/resolution tradeoff inherent with PWM amplifiers. This means that Galil sine amplifiers deliver full 16 bit PWM resolution at a lightning fast 33 kHz. Galil sine amplifiers also now come standard with a current control loop integrator, ensuring accurate and linear current transfer across the entire range of commanded current. As a result, PID response to commanded moves is pinpoint accurate.

<table>
<thead>
<tr>
<th>Amplifier</th>
<th># of Axes</th>
<th>Power</th>
<th>Continuous Current</th>
<th>Peak Current</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3520</td>
<td>2</td>
<td>600 W</td>
<td>8 A</td>
<td>15 A</td>
<td>20-80V DC</td>
</tr>
<tr>
<td>D3540</td>
<td>4</td>
<td>600 W</td>
<td>8 A</td>
<td>15 A</td>
<td>20-80V DC</td>
</tr>
<tr>
<td>D3470</td>
<td>4</td>
<td>1200 W</td>
<td>16 A</td>
<td>30 A</td>
<td>20-80V DC</td>
</tr>
</tbody>
</table>

Current and power specifications are stated per axis.

These features are included with all Galil digital sine amplifiers, which span multiple power ranges, and are compatible with the DMC-40x0 and DMC-41x3 motion controllers. As always, Galil’s commitment to quality and value mean that these amplifiers are offered at an incredible per axis price, feature rich and rock solid.

Amplifiers will begin shipping with these new features on July 1st, 2018 with DMC-40x0 and DMC-41x3 controllers. Amplifiers purchased from Galil after April 1st, 2018 are eligible for a no-cost upgrade while controllers still under warranty, purchased after January 1st, 2017 can be upgraded for a nominal $125 fee. Full support for all new features on these amplifiers will also require 1.3 firmware be installed on the DMC-40x0 or DMC-41x3 motion controller with which they are paired.
Bringing high performance and low cost to the plasma cutting industry, Galil and Dynatorch make a powerful team

In 2003, an aeronautical entrepreneur, Walt Tyler, was manufacturing Gyrocopters in kit form. Walt had a need for a CNC plasma cutting table. His choices were a hobby grade machine for under $9K or a large industrial machine for well over 6 figures. Was there nothing in between? As an entrepreneur, Walt saw an opportunity to fill in that missing segment of the market. Walt reached out to Mike Clem, a CNC software controls engineer and Leon Drake, a mechanical engineer with an extensive CNC Plasma background. In early 2004, the three founded Dynatorch and set out to revolutionize the CNC Plasma industry.

Three critical design criteria were required for this revolutionary plasma table:

1) Budget $12,000 (in 2004).

In a CNC plasma machine, your cutting tool is a flame. The force between the tool and the workpiece is an electric arc and does not demand a 1000 pound gantry. Cost could be reduced with a smaller machine frame and motors.

2) Integrated Torch Height control

If you wanted to control the torch height during a cut in 2004, a separate (sometimes third party) device was needed. No other plasma company offered control of the torch height from within the CNC software. According to Leon Drake “We need to implement this feature into the CNC control software. This feature will set us apart from the rest of the field”.

3) Brushless Servo motors

Servo vs. Stepper? What separated an industrial CNC from a hobby machine were servo drives and motors. No high quality industrial machine used stepper motors, yet all hobby machines used them. If Dynatorch was to enter the industrial arena, they needed true servo drives with real-time encoder feedback to the CNC.

During that initial design, several servo controllers were considered.

The initial supplier chosen, let’s call them Company A, failed to deliver the quality that was needed in an industrial environment. “Controlled Lightning”, as plasma is sometimes described, can wreak havoc on servo drives and controller due to the noise. Company A’s motors were failing in the field and it began to impact the reputation of Dynatorch. In 2011 a change was made and Company L became the new servo supplier. After re-writing the control software, Company L became the default control system for the foreseeable future. However, in less than four years it was learned that Company L was tied to a particular brushless motor that was being discontinued with no replacement available.

In 2015, after disappointments from poor quality and obsolescence, Dynatorch looked to see where was the future of servo controls headed? They found EtherCat

▶(cont. pg 7)
Galil 2-day Live Training Coming in August 2018

Our next two-day product school is Thursday August 9th, 2018 through Friday August 10th, 2018. The training will be at our headquarters in Rocklin, CA (near Sacramento). This technical training provides an overview of Galil products, a description of system elements, tuning, motion programming, software, troubleshooting, and hands-on labs. On the afternoon of the second day there is an opportunity to spend one-on-one time with the application engineers to ask additional questions or discuss individual applications. If you are a new user to Galil or want to learn more, signup now! For more information and to register go to http://www.galil.com/learn/classes or contact Mark Middleton at Mark.Middleton@galil.com. Please register by July 26th, 2018.
Galil. We Move the World.

With over 750,000 controllers installed worldwide, Galil is the leading supplier of motion and I/O 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.galil.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 (US only) or (916) 626-0101 (global) to discuss your project with one of our highly-trained applications engineers.

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**ACCELERATA CONTROLLERS AND DRIVES**

- **DMC-40x0** Ethernet/RS232
- **DMC-42x0** Ethernet/RS232
- **DMC-18x6** PCI

**ECONO CONTROLLERS AND DRIVES**

- **DMC-41x3** Ethernet/USB/RS232
- **DMC-18x2** PCI

**SINGLE-AXIS CONTROLLERS AND DRIVES**

- **DMC-3x01x** Ethernet/RS232
- **DMC-3701x** EtherCat

**EtherCAT MASTER CONTROLLERS**

- **DMC-500x0** Ethernet/RS232
- **DMC-52xx0** Ethernet/USB

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**POCKET PLC I/O CONTROLLER**

- **RIO-47xxx** Ethernet/RS232
- **RIO-574x0** EtherCAT

**SOFTWARE TOOLS**

- **GDK.** Galil’s seamless software
- **Ladder Interface.** Converts ladder program into DMC code for RIO Pocket PLC.
- **Galil PVT.** Software tool for PVT mode of motion.

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**FREE Online Support Tools**

- Application notes, white papers and industry articles: http://www.galil.com/learn/application-notes
- Tutorials and videos about servo tuning, motion programming, & motors and drives: http://www.galil.com/learn/online-videos
- MotorSizer™ Tool for quick sizing of stepper and servo motion systems: http://www.galil.com/learn/motorsizer
- Interactive bulletin board with knowledge base for fast answers to your questions: http://www.galil.com/forum

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