

# MagnaDrive Synchra Series

PROVIDES NO-CONTACT SOLUTION FOR ROTATING EQUIPMENT

MATTHEW JASTER, SENIOR EDITOR

Trouble-shooting often leads to product development. This was the case when MagnaDrive (Woodinville, Washington) was approached by several customers to help prevent downtime in various machining operations. In previous circumstances, the couplings, bearings, and motors were failing prematurely due to vibration, heat generation and strong attraction forces.

"One customer application involving elastomeric couplings only lasted around two months before they needed to be replaced," said Jake Lee, global CTO, at MagnaDrive Corporation. "So two years ago, we began to develop a solution where our disc-style couplings could handle higher horsepower, but not cause any axial forces on the motor or load shafts."

The MagnaDrive Synchra couplings (patented May 28, 2019) harness the power of a no-contact, magnet-to-magnet synchronous connection for all types of rotating equipment. Compact and tough, the interior magnet rotors of this patented design uses Neodymium-Iron-Boron magnets—the strongest permanent magnets in the world.

The Synchra Series maximizes torque while eliminating any magnetic slip, resulting in consistent performance for vital equipment, with zero rpm's lost. These couplings are much lighter, and in many cases, half the weight of magnet-to-copper type couplings. They can be used on high-speed applications more often than the magnet-to-copper type.

"We basically developed the Synchra series to reduce the size and the heat generation of our traditional magnet couplings and provide an opportunity to handle a larger range of horsepower," said Geoff Harmon, senior applications engineer at MagnaDrive. "The Synchra has no physical contact between the motor shaft and the load shaft. It creates very large torque in a very compact design. It has a much higher torque to weight ratio than other magnetic couplings."

The end game is a magnetic coupling designed for lifetime operation; a nice change of pace for customer's switching out components every couple of months and shutting down production lines for maintenance and reliability concerns.

## A History of Magnetic Force

MagnaDrive's original patented technology uses high power magnets to create an induced electromotive force used for torque transfer. The system physically separates the two elements of the motor system, placing magnet discs on the load shaft and a conductor assembly on the motor shaft. Motor torque is transferred to the load across an air gap. Varying the air gap between the magnets and conductor changes the strength of the magnetic field and hence controls output speed. A portfolio of 20 domestic and more than 200 foreign patents protects this technology.

This includes disconnected torque-transfer technology that reduces maintenance and operating costs, increasing process availability, and improves system reliability. This



technology is demonstrating substantially reduced energy requirements associated with the operation of a vast base of motors that drive pumps, fans, blowers and other processing and manufacturing equipment used in industry.

Early funding for MagnaDrive was supplied by a grant from the U.S. Department of Energy (DOE). Also, DOE testing demonstrated that MagnaDrive's products reduce energy usage by up to 70 percent. The DOE operates several units in mission critical applications at nuclear facilities. The U.S. Navy and U.S. Air Force also utilize MagnaDrive's technology.

The Synchra series was developed as an evolving piece of technology to handle certain critical applications where other couplings were failing prematurely or causing production downtime.

## Application Examples

Due to the Synchra's ability to handle critical applications, MagnaDrive offered the coupling to a hospital where a customer was having serious vibration and thermal growth issues with a small pump shaft. The Synchra was the best selection for this due to its reliability.

"Most of these applications are critical, so it's really important to use equipment that doesn't shut down for maintenance or doesn't need to be rebuilt or any other problems,"



## ***OFFSET SHAFTS. SOLVED.***

Offset Couplings from Zero-Max reduce space requirements for parallel offset shafts in large system applications. These specialized couplings provide machine designers with an important option for reducing overall machine size and footprint.

Compact in design, Schmidt Offset Couplings transmit constant angular velocity and torque in a wide range of parallel shaft misalignments. Handling high amounts of parallel offset up to 9 inches, they are available with torque capacities up to 459,000 in-lbs.

Schmidt Offset Couplings can be mounted to shaft hubs or directly to existing machine flanges. They are available for shaft displacements of 0.156 inches to 17.29 inches and torque capacities from 55 to 459,000 inch-pounds. Many design configurations are available including specials.



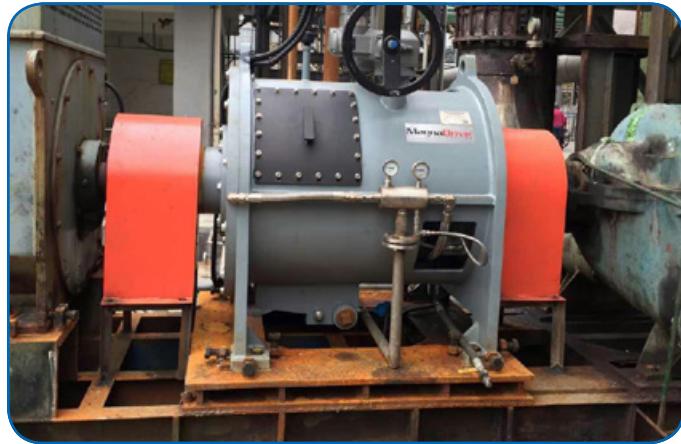
Harmon said. "If they can install components that just run over a lifetime, they'll be much better off long-term regarding efficiency and reliability."

In this application, the Synchra coupling reduced most of the vibration and solved the misalignment issues that had occurred with previously-installed radial couplings. Although this coupling is heavier than a standard coupling, the bearing can handle the added weight. "The weight was not the issue," Lee said. "The issue was the vibration. The Synchra does not transmit vibration through the coupling."

"If you have a vibrating load shaft the Synchra coupling will not transmit it back to the motor. This will occur if you've installed a solid coupling," Harmon added. "The vibration ends up through the system while our coupling is basically a big shock absorber."

Another application example involved controlling an aggregate mixer that was causing too much torque and significant damage in the process.

"Our coupling is ideal for overload protection from high torque as it will slip at the same torque specification every time and will not damage the equipment. It will keep the



belts from breaking and prevent any damage to motors, bearings, etc.," Lee said.

Harmon said that the company tests these couplings thoroughly at their own R&D facility before they go out to market. "Even though our customer's expectations for magnetic couplings are very high and they've been on the market for a long period of time, they still want to see advancements in areas like efficiency and reliability."

With each application, MagnaDrive finds new and exciting ways to bring this magnetic technology to market. Case in point, one of the first customers that purchased the Synchra coupling was for an electric locomotive.

"You never know who might be interested in the technology. It was surprising to find out that our coupling was being used to drive these electric locomotives. This is very different and unique from our other customer requests," Harmon said.

### **Additional Benefits**

What are some of the other advantages of this technology? Both Lee and Harmon said there's no risk from heat due to clashing even from wrong installation or rotating equipment

bearing failure. Only a speed sensor is required to monitor operating conditions for the load speed in case of any RPM slip to prevent some increased vibration. Any RPM slip should trip the coupling so no heat and vibration are generated. Magnet and copper-type couplings always have some slip to operate which can cause heat from magnetic friction. Clashing is also a source for heat from the magnet/copper type couplings, but the Synchra does not slip so clashing does not damage the coupling.



"If customers are using very low-speed applications, the Synchra coupling can be utilized without any heat during operation," Lee said.

And Harmon believes the diversity of the component is also noteworthy. "You can utilize the Synchra in any pump application where there are misalignment issues, load seizures, shock loading, even boiler feed pumps that run at high temps where the shaft turns the pump and thermal expansion occurs. We will eliminate those issues with the Synchra," Harmon said.

Material handling is another area where these couplings can thrive. Any application such as conveyors, buckets, elevators or excavators that may need torque protection, for example.

### **An Evolving Technology**

As machinery evolves, so will the components within each system. MagnaDrive is increasing the horsepower for the Synchra line. They offer 200 and 300 hp capabilities and they're currently going into 400 hp as well. "We'll continue to scale up as customer demand increases," Lee said.

"We're also working on heatless versions that can be installed in hazardous environments," Harmon added. "Components that can meet these requirements without any instrumentation or monitoring whatsoever, this would be ideal. We're looking at that for the future."

### **For more information:**

MagnaDrive Corporation  
Phone: (425) 463-4700  
[www.magnadvice.com](http://www.magnadvice.com)



**MOTION + POWER**  
TECHNOLOGY EXPO

# GEAR ELECTRIC FLUID POWER

MOVING THE FUTURE.

**OCTOBER 15–17, 2019 | COBO CENTER | DETROIT, MICHIGAN**

Shop and compare the full range of power transmission solutions utilizing mechanical power transmission, pneumatics, hydraulics, electric motors, and drives.

**250+** exhibiting companies  
**50** first-time exhibitors  
showcasing unique solutions

**FLUID POWER PAVILION** — your destination to learn if hydraulics and pneumatics could improve your project.

**EMERGING TECHNOLOGY PAVILION** — provides a look at new, cutting-edge technology that is coming into the manufacturing space.

To search a complete list of exhibitors by name or product category, visit [MotionPowerExpo.com](http://MotionPowerExpo.com)

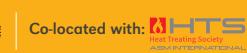


American  
Gear  
Manufacturers  
Association

Sponsoring organization:



Co-located with:



# ABB

## LAUNCHES SAFETY MOUNT SPHERICAL ROLLER BEARINGS

ABB has launched Dodge Safety Mount spherical roller bearings with a built-in patented locking mechanism that reduces installation time by up to 75 percent compared to traditional products. Best suited for bulk material and air handling applications, the new bearing mounts by tightening fasteners instead of using a hammer and other tools. The new system also allows for simple installation and removal from the same side of the bearing, which means only one person is needed for



the task.

"The new mounting system replaces the blows of a hammer with the tightening of fasteners," says Jim Madsen, Dodge mounted roller bearing product manager, ABB. "It also makes it faster to install large bearings, but more importantly, it makes it safer for the installer."

Safety Mount bearings feature a triple-lip contact seal and corrosion-resistant flinger sealing system which prevents contamination from entering the product during installation and operation. A labyrinth seal option is available for high-speed and high-temperature applications.

Dodge Safety Mount spherical roller bearings come ready for installation of the ABB Ability™ Smart Sensor for mounted bearings, an easy-to-use, wireless sensor that monitors the health of bearings.

Safety Mount spherical roller bearings combine the advantages of the Dodge Imperial family of bearings; factory sealed and greased, shaft ready out of the box, with no feeler gauges required. Safety Mount bearings are offered in split cap and single piece housing options in standard SAF, metric SN, Type E, and Imperial housing dimensions in sizes 4<sup>15</sup>/<sub>16</sub>" to 7" (115 mm to 170 mm).

### For more information:

ABB

Phone: (800) 435-7365

[www.abb.com](http://www.abb.com)



## CLUTCHES & BACKSTOPS

### Prevent Reverse Rotations & Overheating

Quality designs and features are key when it comes to clutches and backstops. From preventing reverse rotations to overheating, Tsubaki clutches and backstops are designed to outperform the competition.



YOUR SIDEKICK FOR  
OPTIMIZING OPERATIONS.

©2019 U.S. Tsubaki Power Transmission, LLC All Rights Reserved.



90 MISSILES  
330 SAILORS  
1,100 MILES OUT  
TO SEA

ZERO  
ROOM  
FOR GEAR  
DRIVE  
FAILURE.



Whether it's the frontline combat fleet of the U.S. Navy or your own gear drive operation needs, Philadelphia Gear delivers mission-critical performance and reliable, responsive support.

With unmatched expertise that's on call 24/7, plus complete warranty coverage on workmanship and material for any gear drive we service, including those from other manufacturers, we've set the standard in dependability — on land and at sea — for more than 125 years.

**Keep your mission moving.**

Visit [PhilaGear.com/MyMission](http://PhilaGear.com/MyMission) to learn more.

# Bosch Rexroth

CYTROBOX OFFERS EFFICIENT, INTELLIGENT, COMPACT HYDRAULIC SOLUTION

Connecting machines and facilities with IT systems opens up enormous potential for more economical and intuitive processes. This is exactly where Bosch Rexroth's new CytroBox hydraulic power unit comes in. With its intelligent, energy-efficient modular design, CytroBox provides a new solution for the medium performance range up to 30 kW. With its integrated IoT technol-

ogies, CytroBox is paving the way for consistently implementing Industry 4.0 concepts.

CytroBox is a hydraulic power unit for applications in the medium performance range up to 30 kW. The current consumption is parametrized and optimized with regard to the existing electrical cabinet. Pre-set controllers in variable-speed pump drives adjust



energy requirements on an individual basis.

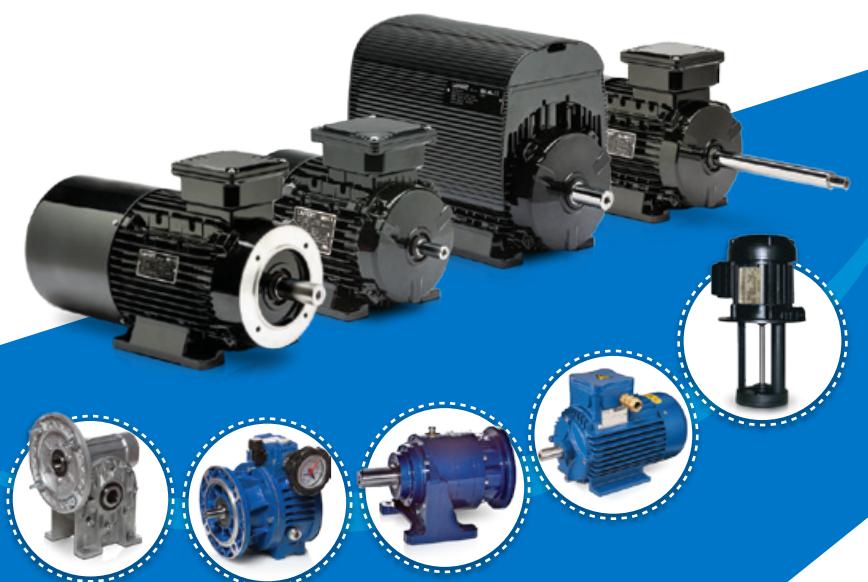
The speed is switched off during no load in order to save energy and is controlled under full load in a closed loop to the exact pressure command value with a highly dynamic response. This saves up to 60 percent of energy compared to conventional power units. The high efficiency of the manifold block, which is manufactured using the 3D sand core printing method, also contributes to overall efficient operation. Made via additive manufacturing, the manifold block is up to 40 percent more compact and boasts improved flow channels. This improves oil flow, reduces pressure losses and minimizes the areas where leaks could occur because fewer plug screws are required. The hydraulic power unit is also equipped with an active dewatering unit to protect against external contamination.

#### For more information:

Bosch Rexroth  
Phone: (800) 739-7684  
[www.boschrexroth.com](http://www.boschrexroth.com)

## YOUR BEST SOURCE FOR METRIC

MOTORS, GEARBOXES & COOLANT PUMPS



 **LAFERT NORTHAMERICA**

Toll Free: 1.800.661.6413 Fax: 1.905.629.2852  
[www.lafertna.com](http://www.lafertna.com) Sales1@lafertna.com

Copyright Lafert North America 2017. All rights reserved.



**EASA**  
The Electro-Mechanical Authority





VISIT US AT BOOTH #3418

# TRUSTED WHEN FAILURE IS NOT AN OPTION

When there is absolutely no room for error,  
we deliver extreme accuracy, reliability,  
and unyielding consistency.



**Excellence  
without  
exception.**



[forestcitygear.com](http://forestcitygear.com)

# Haydon Kerk Pittman

EXPANDS BRUSHLESS DC MOTOR SERIES

Haydon Kerk Pittman is pleased to announce the latest addition to its popular line of brushless DC motors: the EC042B IDEA Motor Series. This revolutionary new product combines exceptional performance with convenience and value.

The programmable IDEA Motor integrates a precision brushless servo motor with an IDEA Drive controller in a compact package to reduce design time, wiring needs, and cabinet space, leading to lower overall system costs. The IDEA Motor is specifically designed for real-time embed-



## The Power of One<sup>2</sup>

**Your Objective:**

One face in perfect alignment with another. *For infinity.*

### No problems. No distress. No delays.

That's the same objective you have for choosing your gear producer. Circle Gear's objective is to engage with every customer's objectives.

- One to 1000 gears
- Customer designed or reverse engineered
- Gearbox repair, rebuild or redesign
- OEM or end-users
- ISO 9001:2015 Certified

1501 S. 55th Court, Cicero, IL 60804

(800) 637-9335

(708) 652-1000 / Fax: (708) 652-1100

[sales@circlegear.com](mailto:sales@circlegear.com)

[www.circlegear.com](http://www.circlegear.com)



Spiral and Straight Bevel Gears (Cut, Ground or Lapped) • Spur Gears • Helical Gears • Long Shafts • Herringbone Gears • Involute and Straight Sided Splines • Internal Gears • Worm and Worm Gears • Racks • Sprockets • ISO Certified



Partnership with Quality Reducer to provide  
Gearbox repair, rebuilding and reverse-engineering.

ded motion control and is ideally suited for autonomous precise execution of complex single-axis motion.

Save money and space by utilizing the IDEA Motor's integrated package of motor, drive, and feedback connections in a compact and programmable unit. A single motor/drive unit reduces motion system components by up to 75% per axis and simplifies machine troubleshooting. Further reductions can be achieved by wiring sensor inputs and control outputs directly to the IDEA Motor, rather than through a control cabinet.

Save time using a pre-engineered, factory-configured and tested servo system. Immediately generate complex precise motion sequences utilizing our free Graphical User Interface that provides an intuitive programming environment to quickly develop, save, and debug complex motion sequences. Since the connections between the drive and motor are made internally, simply connect power, optional I/O connections, and communications, and the IDEA Motor is ready to operate. The EC042B IDEA Motor is also stocked for immediate delivery at the online store.

RS-485 communications fieldbus ports are integrated for programming autonomous motion sequences, monitoring system status, or streaming commands to synchronize motion among multiple motors. The EC042B IDEA Motor is available in three motor lengths, each with optional factory-configurable gearboxes.

#### For more information:

Haydon Kerk Pittman

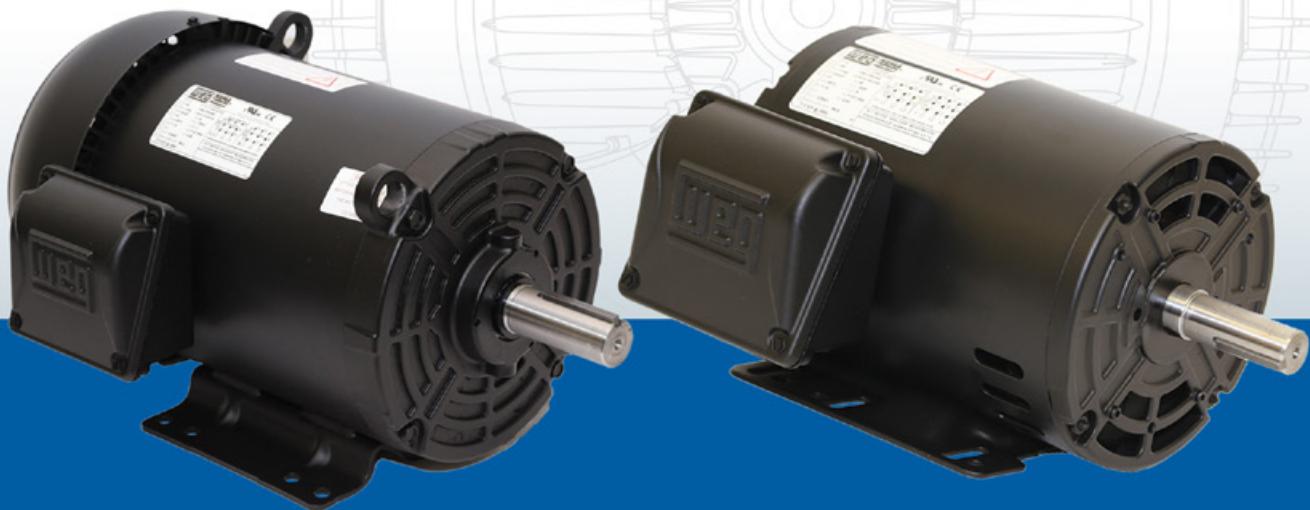
Phone: (267) 933-2105

[www.haydonkerkpitman.com](http://www.haydonkerkpitman.com)

weg

# THE SUPERIOR CHOICE

WEG's proven reliability in a Rolled Steel frame



- Rated Output: .25 to 25 HP
- 3600, 1800, 1200, 900 rpm
- 48-256T frame
- Foot mount, C-Face or footless available
- AEGIS® SGR Inside (up to 20 HP in stock)
- Brake Motors now available

- Robust base and eyebolts
- Superior Cooling System
- Dual Rated 50/60 HZ
- Class F Insulation
- Aluminum Enshields



**Wide Range of Configurations in stock.**

# Igus

## DEVELOPS INTELLIGENT PLAIN BEARING

Igus has developed an intelligent plain bearing, a high-performance plastic that warns of failure and allows machine and equipment operators to plan maintenance, repairs or part replacement in advance. Plain bearings have to withstand considerable adverse influences, such as abrasive dust, chemicals and high speeds. The intelligent bearing from Igus allows operators to

schedule replacement and thus reduce unexpected, costly and lengthy downtime.

If a building machine fails, packaging equipment comes to a standstill, or a wind turbine no longer revolves due to a bearing failure, the breakdown creates stress for operators of the machines and equipment. The



intelligent bearing detects wear and sends a signal to the user if the bearing threatens to fail. Maintenance work can therefore be planned, and operators of agricultural machines, for example, are not surprised during harvest season with an unanticipated breakdown and work stoppage.

"We have primarily developed iglide for difficult-to-access bearing points and for applications where no regular maintenance intervals have been planned," said Stefan Loockmann-Rittich, head of the business unit iglide plain bearings at Igus GmbH.

### Smart Plain Bearings Are Individually Designed

The body of the new smart iglide plain bearing consists of two components: the internal, lubrication-free iglide material and an outer hard polymer shell that protects the bearing. "The customer can choose the material that is most suitable for the application. "The complete range of iglide materials is available," Loockmann-Rittich said.

In order to measure the amount of wear, an intelligent sensor is used between the two components. The measured data of the sensor can be integrated by the machine and equipment operators in their systems in different ways.

### For more information:

Igus Inc.  
Phone: (800) 521-2727  
[www.igus.com](http://www.igus.com)

## UNWIND & REWIND TENSION CONTROL SYSTEMS



**MAGNETIC PARTICLE BRAKES**  
**MAGNETIC PARTICLE CLUTCHES**  
**DIGITAL CONTROLLER**

## LINEAR & ROTARY AXIS DRIVES



**HIGH-TECH PLANETARY REDUCERS**  
**RACKS & PINIONS**  
**SLEWING RING BEARINGS**

## RIGHT ANGLE CONVEYOR GEARBOXES & LUBRICATORS



**RIGHT ANGLE BEVEL SPIRAL BEVEL GEARBOXES**  
**AUTOMATIC LUBRICATION SYSTEMS**



Visit us! Booth #C5608

September 23–25, 2019  
Las Vegas Convention Center  
Las Vegas, Nevada USA

## ANDANTEX USA Inc.

[andantex.com](http://andantex.com)  
[info@andantex.com](mailto:info@andantex.com)

Phone: 877-966-9151  
1705 Valley Road, Wanamassa NJ 07712



STOCK DRIVE PRODUCTS/STERLING INSTRUMENT  
a *Designtronics* company

ENGINEERING  
MANUFACTURING  
ASSEMBLY



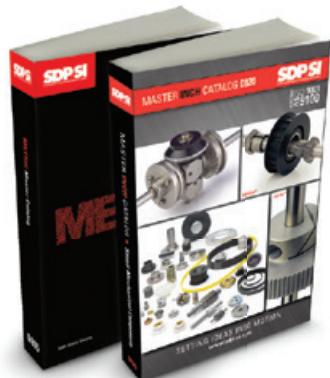
## GET COMPONENT OPTIONS AND DESIGN SOLUTIONS

Gears, Timing Belts & Pulleys, Bearings, Couplings, Hardware  
Custom Mechanical Solutions | Precision Machining | 3D Printing

REGISTERED  
**ISO 9001  
9100**

Stock Drive Products / Sterling Instrument  
250 Duffy Avenue, Hicksville, NY 11801  
Phone: (800) 819-8900 Fax: (516) 326-8827  
email: [sdp-sisupport@sdp-si.com](mailto:sdp-sisupport@sdp-si.com)  
[www.sdp-si.com](http://www.sdp-si.com)

REQUEST A CATALOG



# Applied Motion Products

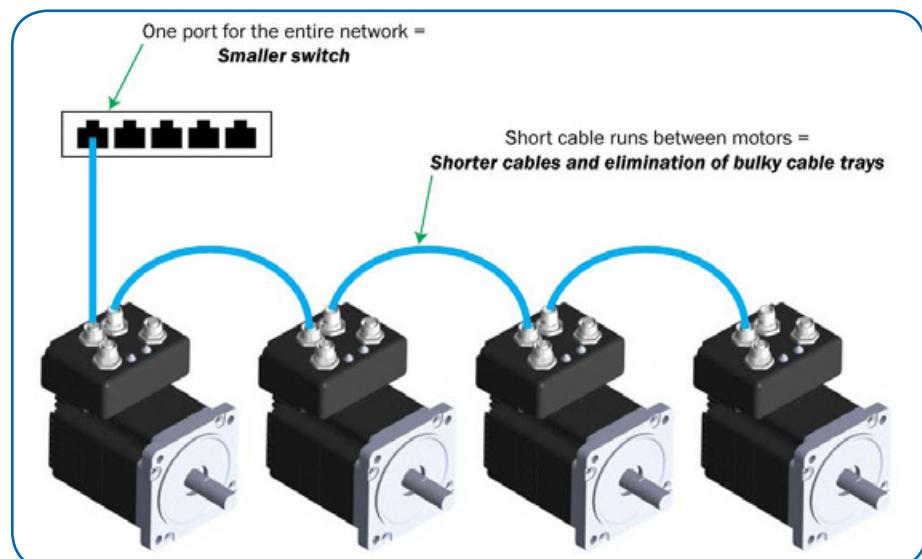
NEMA 24 FRAME INTEGRATED MOTORS OFFER DUAL-PORT COMMUNICATIONS

Applied Motion Products introduces two new NEMA 24 frame integrated motors with dual-port communications for connecting to the industrial EtherNet/IP network of a plant or machine. By incorporating two M12 EtherNet/IP connectors instead of just one on each axis, the SWM24IP-3DE Integrated Stepper Motor and TXM24IP-IDG StepSERVO Integrated Motor support more efficient network topologies such as line networks and daisy-chain connections.

EtherNet/IP network communications are the widely used industrial protocol for manufacturing automation applications. With EtherNet/IP, users can control, configure and query a drive using an open, standards-based, industrial EtherNet connection at speeds up to 100 Mbits/sec. All drive and motor features are accessible over the EtherNet/IP network, including

more than 100 commands and 130 registers for controlling motion, I/O, configuration, polling, math, register manipulation, and Q programming.

The additional EtherNet/IP communications port on the motors allows for cost savings and design simplification by reducing cables, eliminating bulky



spiral bevel gearboxes



Did you mean: **DieQua Corporation?**



## The search is over!

For quality spiral bevel gearboxes that provide improved performance, high reliability and easy maintenance, look no further than DieQua.



- 9 sizes
- 15 ratios
- Power capacities from 1-300 HP
- Low Backlash
- Customizable
- Mounting on all 6 sides



To finally find what you're looking for, check us out on the web, or give us a call.

[diequa.com/pte](http://diequa.com/pte) 800-430-1439

**DIEQUA**  
Corporation

cable trays and downsizing network switches. For example, in a star network, every single motor must connect to the central switch on a dedicated cable. In a line network using motors with dual-port communications, only the closest motor connects to the switch with the rest connecting to each other in a daisy-chain configuration. In addition to shortening cable runs between motors, only one port is needed for the entire network, which means a smaller Ethernet switch.

The SWM24IP-3DE and TXM24IP-1DG integrated motors are IP65 rated for use in splash-zone and dirty environments. Each motor features a NEMA 24 (60 mm) mounting flange, which has the same mounting dimensions as a NEMA 23 motor but with a larger shaft to accommodate a higher torque output. Both

motors include a built-in encoder for enhanced positioning capabilities. The SWM24IP-3DE can perform stall detection and stall prevention functions for more reliable and accurate performance than an open loop motor in a broader range of applications.

The TXM24IP-1DG utilizes Applied Motion's StepSERVO Closed-Loop Stepper technology to greatly improve the performance of the step motor with greater acceleration, increased efficiency, increased accuracy as well as decreased motor heating and noise.

**For more information:**

Applied Motion Products  
Phone: (800) 525-1609  
[www.applied-motion.com](http://www.applied-motion.com)

To be considered for inclusion in our Product News section, send your press releases to Senior Editor Matthew Jaster, [mjaster@powertransmission.com](mailto:mjaster@powertransmission.com). Please be sure to include one or more high-resolution photos with your submission. We regret that we don't always have room for all the submissions we receive, but you can find even more of the latest power transmission and motion control products online at [www.powertransmission.com](http://www.powertransmission.com)

# MASTA

Next generation CAE software for the design, analysis and optimisation of transmission systems

Discover more at [masta.smartmt.com](http://masta.smartmt.com)

DESIGN GEARBOX AND DRIVELINE SYSTEMS FROM CLEAN SHEET OR IMPORTED CONCEPTS

RUN AND GENERATE REPORTS ON A WIDE VARIETY OF ANALYSES INCLUDING STATIC DEFLECTIONS, DURABILITY, EFFICIENCY, FREQUENCY DOMAIN NVH, TIME DOMAIN DYNAMICS AND MORE

**SMT**  
Globally integrated leader in mechanical transmission engineering services and software development

© 2019 Smart Manufacturing Technology

