

# MDrive<sup>®</sup> AccuStep<sup>™</sup>

Revolutionary motor control technology

Technology leading all-in-one brushless step motors  
with integrated revolutionary new control technology.



**IMS**<sup>™</sup>  
INTELLIGENT MOTION  
SYSTEMS, INC.

# The applications

MDrive AccuStep motion systems offer clear advantages in a very cost effective package for a wide range of motion control applications such as:



- Web tensioning
  - Torque mode
- Conveyors
  - Unaffected by transient load changes
  - Variable operating current allows for cool operation
  - Variable current control lowers energy consumption



- Bottle capping
  - Torque mode
- Machining
  - Anti-stall allows drilling
  - Settable speed
  - Settable torque
  - Positioning capability



- Clamping
  - Torque mode
- Feeders
  - Torque mode
  - Settable speed
  - Clutch capability
  - Positioning capability



- Cut to length
  - Torque mode winding
  - Positioning on feeder
- Rotary knife
  - Handles transient load at cut
  - Positioning on feeder
  - Torque mode on unwinding coil



- Form, fill and seal
  - Torque mode on unwinder
  - Positioning on feeder
  - Coordinated motion on sealer

- Package sorter
  - Robust under transient loads
  - Positioning on feeder

- Pick and place
  - Transient loads on intelligent conveyors are handled
  - Precise positioning on gantry
  - No tuning required



## AccuStep proven technology

AccuStep control technology is operating 1000s of axes today. This is a proven technology that is changing the rules of step motor control.



# MDrive AccuStep

All-in-one step motor systems integrated with revolutionary motion control technology that prevents loss of synchronization (unintentional stalling) due to transient or continued overload, extreme acceleration or deceleration, or excessive slew speed.

Learn more about this revolutionary control technology, eBook at [www.imshome.com/accustep](http://www.imshome.com/accustep)

# The technology

AccuStep control not only bridges the gap between servo and step motor technologies, it also delivers unique capabilities and enhancements over both.

AccuStep is a revolutionary, low cost control technology that, when applied to step motors, prevents the loss of synchronization (unintentional stalling) due to transient or continued overload, extreme acceleration or deceleration, or excessive slew speed.

AccuStep control technology is hardware based for real-time response. It continually monitors the relationship between the rotor and stator at sub-microsecond intervals, and will not allow that relationship to exceed the point where synchronization is lost. Delivering smooth movement while eliminating unintentional stalling, AccuStep technology will never lose functional control of the motor.

AccuStep technology offers numerous unique capabilities such as torque mode for regulating and maintaining torque at a set level. While torque mode enhances the many benefits of step motors, which include smooth movement, high starting torque and low speed stability, it also puts their performance on par with small to mid-size servo motors up to 2500 rpm — all at a lower cost and without requiring tuning.

AccuStep control also offers a variable current setting. This feature can be enabled to allow only the required current necessary to perform a task. This efficient, energy-saving setting further enhances system performance by reducing motor heat which can be significant with traditional step motor technology.



## AccuStep control

Combines the benefits of servo and step motor technologies . . .

- plus:*
- no unintentional stalling or loss of synchronization
  - variable current / torque
  - real time control
  - optimum torque at all speeds

## servo motors

- peak torque
- real time control
- torque mode

## step motors

- smooth motion
- stiffness at standstill
- cost effective
- no tuning



### AccuStep system benefits

- Reacts quickly to large changes in loads without loss of synchronization;
- No tuning required;
- Higher inertia mismatch allowed;
- High starting torque;
- Smooth motion, even at extremely slow speeds;
- Minimizes impact of system resonance.

### Enhanced motor performance

- Uses cost effective step motor;
- Eliminates loss of synchronization;
- Allows full use of motor's torque;
- Maintains constant motor torque *with torque mode*;
- Reduces motor heating *with variable current control*.

# The products

MDrive® AccuStep™ products deliver all-in-one brushless step motors with integrated revolutionary new control technology. These advanced, low cost motion systems are changing the rules of step motor control.

MDrive AccuStep products are integrated with 1.8° NEMA size 17, 23 or 34 motors, both rotary and linear, with up to 4 lengths. AccuStep control technology allows full use of a step motor's maximum torque rating, eliminating derating of up to 50% as a buffer against unintentional stalling of standard step motor systems. Operating smaller, lower cost motors requiring less space will benefit many motion control applications.

RS-422/485 communications is standard for all MDrive AccuStep systems, with CANopen available on Motion Control versions. Encoder feedback to the user is available on Step•Torque•Speed versions. IP65 rating is available, with additional options including: linear actuator, planetary gearbox or rear control knob for manual positioning of motor shaft.

Two (2) low cost MDrive AccuStep product versions are available:

## Step • Torque • Speed

AccuStep control technology integrated with step motor, microstepping driver, internal encoder providing feedback to the user, and power supply with MDrive AC input.

Features 3 operating modes.

Step and direction / position mode:  
– reaches a set position

Torque mode:  
– regulates and maintains a set torque  
– controlled via analog input

Speed control / velocity mode:  
– maintains velocity/speed  
– precision digital velocity controller

## Motion Control

AccuStep control technology integrated with programmable motion controller, step motor, microstepping driver, internal encoder, and power supply with MDrive AC input.

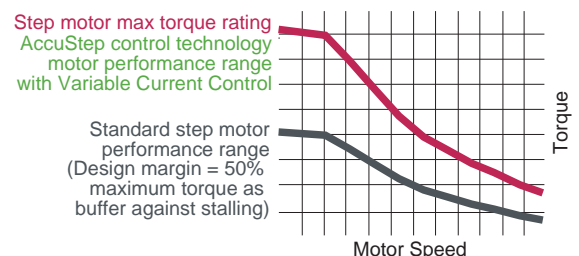
Unique product features:

- fully programmable controller, software provided
- stand-alone solution that can be used without a PLC
- up to 8 programmable +5 to +24 VDC I/O lines
- 10 bit analog input
- high speed position capture input or trip output
- communication options:
  - RS-422/485
  - CANopen
  - Ethernet IP

# 50%

### Speed-torque performance

AccuStep control technology allows full use of a step motor's maximum torque rating, eliminating derating of up to 50% as a buffer against stalling of standard step motor systems.



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