

# Short form product catalog

Leading innovations in drives, controls  
and integrated motion solutions



**IMS**  
INTELLIGENT MOTION  
SYSTEMS, INC.

**Schneider**  
Electric

# MDrive® overview



## Motor with integrated electronics

MDrive® products consist of a 1.8° 2-phase stepper motor and electronics, ideal for machine builders who want an optimized motor with on-board electronics. The integrated electronics of MDrive products reduce the potential for problems due to electrical noise by eliminating the cable between motor and drive.

These compact, powerful and cost effective motion control solutions deliver unsurpassed smoothness and performance that will reduce system cost, design and assembly time for a large range of motion control applications.

A wide range of MDrive product options are offered to meet your system needs. And, for rapid design verification, connectivity accessories are available individually or bundled into all-inclusive QuickStart Kits.

## MDrive product groupings

### MDrive Plus

High torque rotary stepper motor with integrated microstepping drive, plus encoder, controller and power supply\* form a single, compact unit. Integration of motor and electronics reduces installation costs and the potential for electrical noise interference. User-friendly PC commissioning software is provided for rapid communication and programming. \* Integrated components vary with product version and options selected.

### MDrive Hybrid

Hybrid Control Technology™ combines the best of servo and stepper motor technologies, while delivering unique capabilities and enhancements over both. This revolutionary control technology is included in MDrive Hybrid motion systems, which are changing the rules of motor control.

### MDrive Linear Actuator

Leading all-in-one integrated stepper motor plus electronics technology has been combined with linear motion mechanical systems that deliver long life, high accuracy and unsurpassed repeatability. All in an extremely compact, low cost package.

MDrive	Drive voltage	Stack lengths	Motor flange	Holding torque maximum	Product availability		
					Plus	Hybrid	Linear
size 14	+12 to +48 VDC	up to 2	1.4" / 36 mm	36 oz-in / 25 N-cm	yes	—	yes
size 17	+12 to +48 VDC	up to 3	1.7" / 42 mm	75 oz-in / 53 N-cm	yes	yes	yes
size 23	+12 to +75 VDC	up to 4	2.3" / 57 mm	239 oz-in / 169 N-cm	yes	yes	yes
size 34	+12 to +75 VDC	up to 3	3.4" / 86 mm	1061 oz-in / 749 N-cm	yes	yes	—
size 34ac	120 or 240 VAC	up to 3	3.4" / 86 mm	750 oz-in / 529 N-cm	yes	yes	(1)

(1) Consult factory for availability.

### Integrated motion

Save up to

# 50%

of space in the control cabinet

Reduce cabling by up to

# 40%

Cut installation time by up to

# 25%

With

# 100,000s

of MDrive products operating reliably all over the globe, we are the world market leader in the area of compact, low cost integrated motion



**Ethernet now available**

# MDrive® Plus

## Rotary motor with integrated electronics

MDrive® Plus products integrate high torque 1.8° 2-phase rotary stepper motors with electronics. This very broad offering of low cost products is available in three versions: Step/direction input, Motion Control and Speed Control.

### Step/direction input – motor + driver

The simplicity of a stepper motor with integrated microstepping drive, these products accept a broad input voltage range and deliver enhanced performance and speed. Oversized input capacitors are used to minimize power line surges, reducing problems that can occur with long cable runs and multiple drive systems.

### Motion Control – motor + driver + fully programmable controller

A fully programmable motion controller integrated with stepper motor and microstepping drive eliminates the need for a central controller. Programming over RS-422/485 allows for point-to-point or multiple unit configuration utilizing one communication port. Communication options include CANopen or Ethernet (1).

### Speed Control – motor + driver + programmable velocity control

Integrated stepper motor and microstepping drive with programmable velocity control that uses voltage, current or PWM input signals. Setup parameters are programmable and may be changed on-the-fly, utilizing a supplied intuitive communication interface GUI.

MDrive Plus	size 14	size 17	size 23	size 34	size 34ac
Input voltage	+12 to +48 VDC	+12 to +48 VDC	+12 to +75 VDC	+12 to +75 VDC	120 or 240 VAC
Stack lengths available	2	3	4	3	3
Step frequency maximum	5 MHz				2 MHz
Microsteps per revolution	200, 400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 20000, 25000, 25600, 40000, 50000, 51200, 36000 (0.01 deg/μstep), 21600 (1 arc minute/μstep), 25400 (0.001 mm/μstep)				
Operating temp at heat sink	-40° to +85°C			-40° to +75°C	
Options	Encoder, control knob, industrial connectors with IP54 rating, interface cables, QuickStart Kit, Drive Protection Module				
<b>Step/direction input</b>					
Isolated inputs	+5 to +24 VDC sourcing or sinking, or +5 VDC clockwise/counterclockwise			+5 to +24 VDC sourcing or sinking	
Setup parameters	Motor Run/Hold, Current, Microstep Resolution, Motor Direction, Hold Current Delay Time, Clock Type, Clock and Direction Filter, User ID, Enable Active				
<b>Motion Control with programmable controller</b>					
Programmable I/O	Up to 8 lines, tolerant to +24 VDC, TTL level compatible				
Communication protocols	RS-422/485 standard; optional CANopen or Ethernet (1)				
<b>Speed Control with programmable velocity control</b>					
Input signals	—	Voltage, Current or PWM			—
Setup parameters	—	Acceleration, Deceleration, Analog Input Mode, Analog Deadband, Analog Full Scale, Analog Input Filter, Joystick Center, Motor Direction, Fault/Checksum Error, Motor Hold Current, Motor Settling Delay Time, Motor Run Current, Hold Current Delay Time, Microstep Resolution, Stop/Start Debounce, Initial Velocity, Maximum Velocity, User ID			—

(1) Consult factory for availability.



**QuickStart Kits**  
speed your design verification with bundled all-inclusive connectivity

**Industrial level I/O**  
from +5 VDC to

**+24 VDC**

eliminates the relay required in lower voltage systems

Up to

**8 I/O**

programmable

**Industrial connectors**  
with IP54 rating

# MDrive® Hybrid

## Integrated motion systems with hybrid technology

Hybrid Motion Technology™ (HMT) combines the best of servo and stepper motor technologies, while delivering unique capabilities and enhancements over both.★ HMT control technology is included in MDrive® Hybrid motion systems which solve many servo applications with a low cost stepper solution.

The integrated design of MDrive Hybrid systems feature HMT control with a 1.8° 2-phase stepper motor, microstepping drive, internal encoder, controller (1) and power supply (2) in a single compact package. Both rotary and linear motor systems are available. RS-422/485 communication is standard for all MDrive Hybrid systems which are available in two versions: Step • Torque • Speed and Motion Control.

### Step • Torque • Speed – HMT + motor + driver + encoder

This version has three operating modes. Step/Direction mode is set to reach a position. Torque/Force mode maintains a constant motor torque set by the user. Speed Control mode maintains velocity/speed with a precision digital velocity controller. This system also provides encoder feedback to the user.

### Motion Control – HMT + motor + driver + encoder + fully programmable controller

A fully programmable controller makes this a stand-alone motion control solution that can be used without a PLC. There are up to 8 programmable +5 to +25VDC I/O lines along with 10-bit analog input and high speed position capture input or trip output. Communication options include CANopen or Ethernet (3).

MDrive Hybrid	size 17	size 23	size 34	size 34ac (2)
Input voltage	+12 to +48 VDC	+12 to +60 VDC	+12 to +75 VDC	120 or 240 VAC
Stack lengths available	3	4	3	3
Communication protocols	RS-422/485 standard; optional CANopen or Ethernet (3)			
Options	Linear motor, control knob, interface cables, QuickStart Kit, Drive Protection Module			
<b>Version availability</b>				
Step • Torque • Speed	—	yes	yes	yes
Motion Control (1) (3)	yes	yes	—	yes

(1) Motion Control products include an integrated controller that is fully programmable using RS-422/485 or Ethernet protocols.

(2) MDrive 34ac products include an integrated power supply.

(3) Motion Control products are available with optional CANopen or Ethernet communication. Consult factory for availability.

### HMT control

Allows

# 100%

use of a step motor's maximum torque rating

Eliminates motor derating of up to

# 50%

as buffer to avoid stalling in standard step motor systems

With

# 1000s

of axes operated by MDrive Hybrid today, this technology is proving it's a motor control rules changer



### System benefits

- Quick reaction 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
- Minimized impact of system resonance

### Enhanced motor performance

- Real time closed loop control intervenes as required
- Eliminates loss of synchronization
- Allows full use of motor's torque
- Never loses functional control of the motor
- Controllable motor torque via Torque Mode
- Variable current control applies only the current needed thereby reducing motor heating, lowering energy consumption and saving money



# MDrive® Linear Actuator

## All-in-one linear motion systems

MDrive® Linear Actuators combine leading all-in-one integrated motor technology with linear motion to deliver high accuracy, unsurpassed repeatability and long life, all in an extremely compact, low cost package.

These innovative linear motion systems feature high torque 1.8° 2-phase stepper motors with a choice of two linear actuator styles: Non-Captive Shaft and External Shaft. High quality precision rolled lead screws used with MDrive Linear Actuators are manufactured from premium grade stainless steel, designed specifically for motion control applications to deliver long life and quiet operation.

MDrive Linear Actuator motion systems are available with a rugged internal encoder option. This powerful feature adds closed loop feedback, but does not increase the MDrive product's compact footprint.

MDrive Linear Actuators are offered in two operating platforms, each with 2 product versions. Linear actuators with MDrivePlus operating platform are available with Step/direction input or Motion Control versions. With the MDriveHybrid operating platform, choose either Step•Torque•Speed or Motion Control versions.



**Innovative**  
integrated linear motion  
= more motion success

**Compact all-in-one**  
linear stepper motor  
+ microstepping drive  
+ programmable control  
+ internal encoder

## 2/2/2

2 linear shaft styles in  
2 operating platforms  
each with  
2 product versions

MDrive Linear Actuator		size 14	size 17	size 23
Length without screw	inches	2.3	2.2	2.65
	mm	58.4	55.9	67.3
Screw length	inches	3.0 to 18.0	3.0 to 18.0	3.0 to 24.0
	mm	76 to 457	76 to 457	76 to 610
Screw diameter	inches	0.25	0.25	0.375
	mm	6.35	6.35	9.525
Nominal load limit		up to 50 lbs	up to 50 lbs	up to 200 lbs
Screw ends available		4	4	4
Options		Teflon coated screws, encoder, interface cables, QuickStart Kit, Drive Protection Module		
<b>Shaft styles</b>				
Non-captive shaft		yes	yes	yes
External shaft		yes	yes	yes
<b>Operating platforms / versions</b>				
MDrivePlus	Step/direction input	yes	yes	yes
	Motion Control	yes	yes	yes
MDriveHybrid	Step•Torque•Speed	—	—	yes
	Motion Control	—	yes	yes





Up to 2 standard MDrive products  
ship within 5 working days.

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