SureStep Stepper Motors

High-torque Stepping Motors

SureStep high-torque stepping motors are designed to handle a wide range of automation applications such as woodworking, assembly, and test machines.

Available in both single-shaft and dual-shaft configurations:

- NEMA 23, 24, 34, and 42 mounting flanges
- Holding torque ranges from 8 to 135 oz-in
- 1.8° per step, 200 steps per revolution
- Extension cables can be easily cut to length, if desired
- Square frame design produces high torque
- CE compliant

Dual shaft motors feature:

- All "D" model (dual-shaft) step motors come with pre-drilled holes in the rear end cap for easy encoder mounting
- Encoder included with "E" model (for position feedback)
- Encoder adapter plate available for NEMA 42 motors

Leadshine 2-phase Digital Stepper Drives

High-quality, 2-phase, digital stepper drives offering a basic feature set at an unbeatable value.

- All drives support step and direction control (some support CW/CCW)
- Model DM805-AI also supports multiple analog control modes
- Motor auto-configuration on power up
- Micro-stepping for smooth motor movement
- Wide range of input voltages supported (12-110 VDC, 18-80 VAC)
- Pulse input frequency up to 200kHz
- Soft-start at power on
- Automatic idle-current reduction
- Over-voltage and overcurrent protection
- Removable screw terminals for easy hook-up
- Optically-isolated inputs ready for +5VDC logic or use dropping resistors for 12/24VDC (EM series only)
- No software required for configuration; DIP switch and/or rotary-dial setup
- DIP switch used for built-in self-test, microstep resolution selection, current level selection, and optional idle-current reduction
- Optional Pro Tuner software for EM-S Series and DM-805-AI drives
- NEMA 11, 17, 23, 24, 34 and 42 frame size step motors supported

SureStep High-performance Stepper Drives

SureStep stepper drives use advanced microstepping technology to smooth the motor motion and stepping response.

Standard drive features:

- Six models: 5 with DC input, 1 with AC Input (high-bus voltage)
- 2-phase digital stepper drives
- High-speed pulse input; pulse and direction, CW/CCW
- Wide range of input voltages supported (12-80 VDC, 115/230 VAC)
- Pulse input frequency up to 2MHz
- Automatic idle-current reduction
- Over-voltage and overcurrent protection
- NEMA 11, 17, 23, 24, 34, and 42 frame size step motors supported
- On-board or removable screw terminals for easy hook-up
- Encoder included with "E" model (for position feedback)
- Encoder adapter plate available for NEMA 42 motors

Advanced drive features:

- Two models with all the features of the standard drives, plus:
  - Software configurable (no DIP switches)
  - 200 - 51,200 microsteps (software selectable)
  - Higher output currents (up to 10A)
  - High-speed pulse input (pulse/direction, CW/CCW, A/B quadrature)
  - Adjustable input filtering for smooth motion and quiet operation
  - Analog velocity mode (0-5V or potentiometer)
  - Internal indexer allows point-to-point moves via ASCII commands (SCL over RS-232)
SureStep® Stepper Systems

Integrated drive/motor units that combine accurate position and speed control will save panel space, require less wiring, and are less expensive!

- DC power supply required (12-48 VDC or 12-70 VDC)
- Pulse Input (Step/Direction, CW/CCW, A/B Quad), Internal Indexing, and Analog Velocity control modes available
- Digital input filtering
- “E” models include an encoder (externally-wireable for Standard models, internal-only for Advanced models)
- Three optically isolated digital inputs, 5 to 24 volts
- Step input signal smoothing (microstep emulation), performs high resolution stepping by synthesizing coarse steps into fine microsteps
- Dynamic smoothing, software-configurable filtering for use in removing spectral components from command sequence, reduces jerk, limiting excitation of system resonance
- Anti-resonance (electronic damping): raises the system-damping ratio to eliminate midrange instability and allow stable operation throughout the speed range of the motor
- Idle current reduction range of 0-90% of running current after a delay selectable in milliseconds (Standard models = 50/90%, DIP switch selectable)
- Models with optional encoder (“E” models) have an externally wireable encoder which can provide feedback to an external controller
- Configurable hardware digital noise filter, software noise filter
- Non-volatile storage, configurations are saved in FLASH memory on-board the DSP
- Dynamic current control, software configurable for running current, accel current, idle current, to make motion smoother and the motor run cooler

Standard Integrated Motors/Drives (STP-MTRD-x)
- Configurable via DIP switches
- Available torque from 68 to 210 oz-in
- Models with optional encoder (“E” models) have an externally-wireable encoder which can provide feedback to an external controller

Advanced Integrated Motors/Drives (STP-MTRD-xR)
- Step and Direction, CW/CCW, and A/B Quadrature/Encoder following
- Velocity and position modes (internal indexing)
- Control via streaming SCL commands over RS-485
- RS-485 ASCII (2- or 4-wire) communications
- Models with optional encoder (“E” models) have an internal encoder to provide improved position and speed control
- Four “Variable I/O” points, 5 to 24 volts (NEMA 24 models)
- Analog input for speed and position, 0 to 5 VDC
- Configurable via SureMotion Pro software
- Available torque from 54 to 340 oz-in

For the latest prices, please check AutomationDirect.com.
FREE configuration software for advanced stepper drives and advanced integrated motor/drives (software is not required for standard drives)

- Available for SureStep advanced drives: STP-DRV-4850, -80100, & STP-MTRD-xxxxxR
- Used for easy configuration and setup of the drive, including drive, motion control mode, I/O, motor
- Open, save, upload, download configuration files to advanced drives and drive/motors
- Status monitor screen aids in troubleshooting alarms and faults
- Self Test mode verifies motor wiring and functionality
- SCL terminal window allows testing/verification of SCL (serial ASCII) commands before PLC programming begins.
- Help files include technical data, application information, advanced setup, serial command instructions

SureMotion Pro

SureStep Linear Power Supplies
These unregulated linear power supplies offer full load outputs of 32 VDC/4A, 48 VDC/5A, 48 VDC/10A, & 70 VDC/5A; and are perfectly suited to power SureStep and Leadshine stepper drives and stepper motors.

- 120/240 VAC selectable input
- 32V, 48V, 70V DC output models available
- Linear power supplies are much less susceptible to regeneration overvoltage from the motor than switching supplies
- Fusing included for both incoming AC and outgoing DC
- All models offer regulated 5VDC, 500mA output (with electronic overload protection) to power control signals between the stepper drive and the host controller (PLC)

Four Models:
- STP-PWR-3204 (32 VDC @ 4A, 5VDC @ .5A)
- STP-PWR-4805 (46.5 VDC @ 5A, 5VDC @ .5A)
- STP-PWR-4810 (46.5 VDC @ 10A, 5VDC @ .5A)
- STP-PWR-7005 (70 VDC @ 5A, 5VDC @ .5A)
- PSP12-xxx (12 VDC)
- PSB24-xxx (24 VDC)
- PSB48-xxx (48 VDC)

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SureStep Regen Clamps
In many stepper systems, a regen clamp is required to limit the power supply bus-voltage when the motor is decelerating a significant load.

- Built-in power resistor (with heat sink) for continuous current handling
- Voltage range: 24-80 VDC, no user adjustments required
- Power: 50W continuous, 800W peak
- Indicators (LED):
  - Green = power supply voltage is present
  - Red = clamp is operating (usually when stepper is decelerating)

Please note that regen clamps may be required in more situations with a switching supply (than with a linear power supply) if braking regeneration is an issue in a specific application.

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Stepper Encoders

Capacitive Encoders

AMT series encoders from CUI Devices are advanced capacitive encoders that are typically mounted to the back of a stepper motor but can also be used in many other applications:

- Software configurable models with resolutions up to 4096 ppr using quadrature (that's over 16k counts!)
- DIP switch configurable units with up to 2048 ppr
- All AMT incremental encoders have quadrature output signals and are available in single-ended (totem-pole) and line driver output models
- Models available to use as replacement encoders for those pre-mounted on STP-MTR(x)-xxxxE stepper motors
- Add as an optional encoder (purchased separately) for standard integrated motor/drives and standalone dual-shaft motors in all NEMA 14, 17, 23, 34, and 42 motors
- All SureStep (D) model (dual shaft) motors come with pre-drilled holes in the rear end cap for easy encoder mounting (NEMA 42 models require STP-MTRA-42ENC encoder mounting plate)
- Installation tools and mounting hardware are included with all replacement encoders

Capacitive encoders are rugged

Derived from the same principles used in digital calipers, these encoders:

- Tolerate a range of environmental contaminants such as dust, dirt, and oil
- Offer excellent immunity to vibration and temperature extremes
- Longer life (no LED), smaller footprint, and lower current consumption (6 to 18 mA) than an optical encoder
- Immune to magnetic interference and electrical noise

SureStep Modular Kit Encoders for Stepper Motors

Optical Stepper Encoders

- Optional encoders can be purchased separately for standard integrated motor/drives and standalone dual-shaft motors in all NEMA 14, 17, 23, 34, and 42 sizes
- All (D) model (dual-shaft) step motors come with pre-drilled holes in the rear end cap for easy encoder mounting (NEMA 42 models require STP-MTRA-42ENC encoder mounting plate)
- Pre-installed encoders on standalone dual-shaft motors and standard integrated motor/drives can be retrofitted with a different encoder if desired

Optical Encoders

- Fixed resolutions of 400 ppr or 1000 ppr
- Choose line driver or push-pull (totem) output signals

Replacement Stepper Encoders

Available for the pre-installed units on “E” model standard motors and integrated motor/drive standard models with encoders. Installation tool and mounting hardware is included with all replacement encoders.

AMT Viewpoint
FREE Stepper Encoder Configuration Utility

For configurable encoders STP-MTRA-ENC9, STP-MTRA-ENC10, AMT11, AMT31, AMT13, and AMT33

- AMT Viewpoint autodetects the encoder and allows PPR selection from 40 to 4096 ppr
- Viewpoint PC software utility connects to encoder using the AMT-PGRM-17C or AMT-PGRM-18C cable
- Software allows custom Z Pulse alignment at any position, before or after the encoder is installed

For the latest prices, please check AutomationDirect.com.