

Accessories

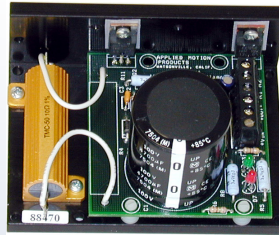
Power Supplies

Applied Motion offers two matched power supplies for use with the ST Drives. A 24VDC, 150W (part number PS150A24) and a 48VDC 320W version (Part Number PS320A48). These power supplies have current overload capability making them ideal for use with stepper drives.

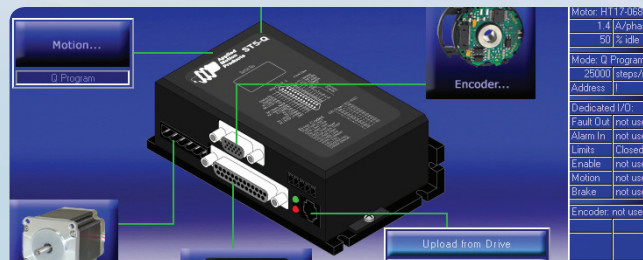


RC-050 Regeneration Clamp

The RC-050 regeneration clamp is for use where regeneration from the motor may cause damage to the drive. In these cases the RC-050 is connected between the drive and power supply and absorbs regenerated energy.

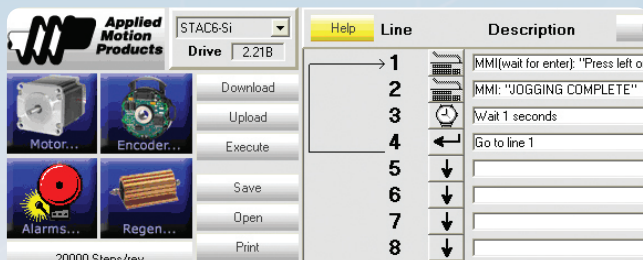


Software



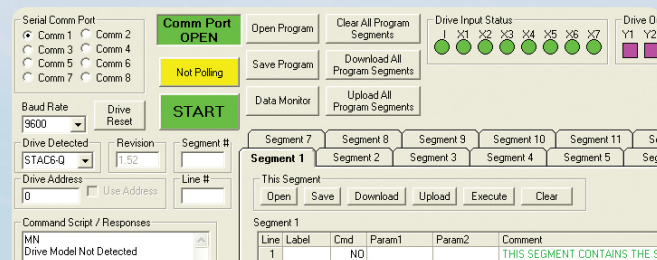
ST Configurator™

Used for setup and configuration of the drive. For more information about the ST Configurator™ visit the Applied Motion Products Website



Si Programmer™

Intended for use in stand-alone applications, Si Programmer™ provides a user friendly, point-and-click, graphical interface that doesn't require any previous programming experience.



Q Programmer™

Q Programmer is used to create and edit stand-alone programs for Q version drives. The functions of these drives include multi-tasking, math, register manipulation, encoder following, and more.



Help Manuals

ST Configurator™ incorporates context sensitive help. All the technical data, application information and advice on setting up the drive is just a mouse click away.

All software applications run on Windows 7 (32-bit & 64-bit), Vista, XP, 2000, NT, ME, 98.



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DISTRIBUTED BY:

ST Stepper Drives



A Performance Step Drive with 4 Control Options for OEM Applications

- ✓ Advanced Current Control
- ✓ Anti-Resonance
- ✓ Torque Ripple Smoothing
- ✓ Microstep Emulation
- ✓ Stall Detection/Prevention

Specifications

POWER SUPPLY:

- ST5 24-48 VDC
- ST10 24-80 VDC

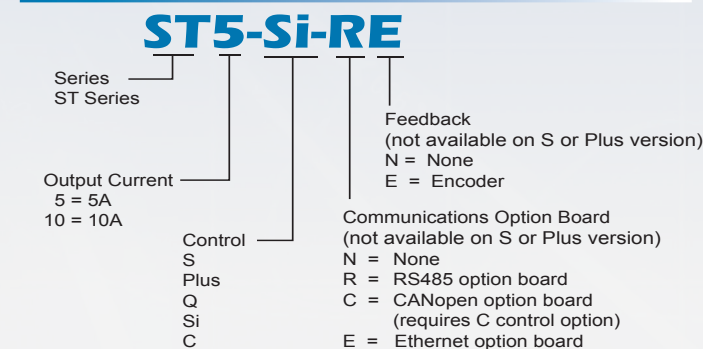
OUTPUT CURRENT:

- ST5 0.1 - 5.0A Peak
- ST10 0.1 - 10.0A Peak

PROTECTION:

- Over-Voltage
- Under-Voltage
- Over-Temp
- Motor Shorts
- Motor Open Phase

Ordering



Models

- Pulse & Direction
- CW/CCW Pulse
- A/B Quadrature
- Velocity (Oscillator) mode
- Host commands (SCL compatible)
- SiNet Hub compatible
- ST Configurator™ software for setup
- Executes stored Q programs
- Networking with RS-485 or Ethernet options
- Conditional Processing
- Math Functions
- Multi-tasking
- Register Manipulation
- Encoder Following
- Third-party HMI compatibility
- Si Programmer™ with built-in Configurator
- Point-and-click indexing software
- User Friendly GUI
- I/O and motion programming
- MMI-01 compatibility
- CANopen protocols DS301 and DSP402
- Profile Position, Profile Velocity, and Homing modes
- Up to 127 axes per channel
- Execute stored Q programs

For more information go to
www.applied-motion.com/ST

Specifications

POWER AMPLIFIER: All Models

AMPLIFIER TYPE	Dual H-Bridge, 4 Quadrant
CURRENT CONTROL	4 state PWM at 20 Khz
OUTPUT CURRENT	ST5 Series 0.1 – 5.0 amps/phase in 0.01 amp increments ST10 Series 0.1 – 10.0 amps/phase in 0.01 amp increments
POWER SUPPLY	ST5 Series External 24 - 48 VDC Power Supply Required ST10 Series External 24 - 80 VDC Power Supply Required
PROTECTION	Over-Voltage, Under-voltage, Over-Temp, Motor/wiring shorts (Phase-to-Phase, Phase-to-Ground).
IDLE CURRENT REDUCTION	Reduction range of “0 – 90%” of “Running Current” after delay selectable in milliseconds.
AMBIENT TEMPERATURE	0 to 55 °C (32 - 158 °F) (ST10 must be mounted to suitable heatsink)
HUMIDITY	90% non-condensing.

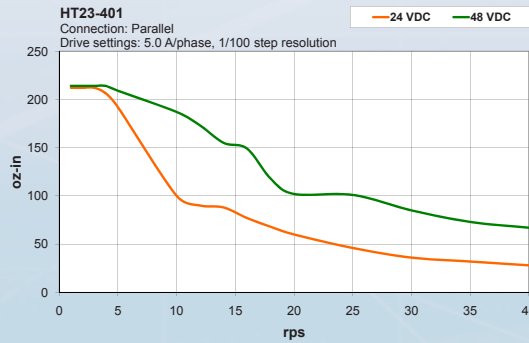
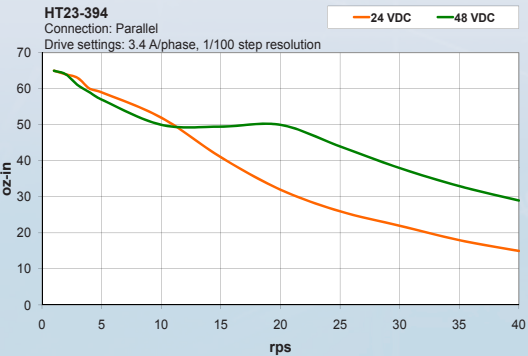
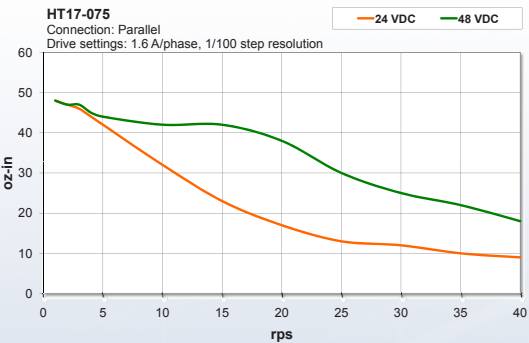
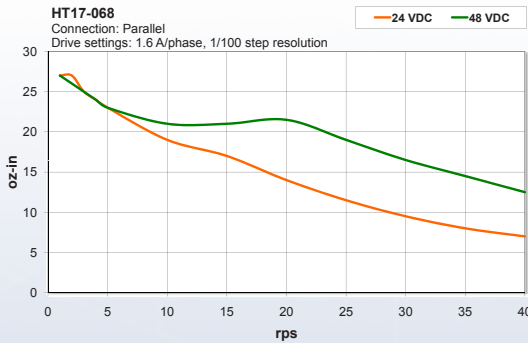
CONTROLLER: All Models

NON-VOLATILE STORAGE	Configurations are saved in FLASH memory on-board the DSP.
MICROSTEP RESOLUTION	Software selectable from 200 to 51200 steps/rev in increments of 2 steps/rev.
ANTI-RESONANCE (Electronic Damping)	Raises the system damping ratio to eliminate midrange instability and allow stable operation throughout the speed range and improves settling time.
TORQUE RIPPLE SMOOTHING	Allows for fine adjustment of phase current waveform harmonic content to reduce low-speed torque ripple in the range 0.25 to 1.5 rps
AUTO SETUP	Measures motor parameters and configures motor current control and anti-resonance gain settings
SELF TEST	Checks Internal & External Power supply voltages. Detects open motor phases. Detects encoder wiring and signal faults (differential encoder only).
MICROSTEP EMULATION	Performs high resolution stepping by synthesizing fine microsteps from coarse steps (Step & Direction Mode Only) .
COMMAND SIGNAL SMOOTHING	Software configurable filtering reduces jerk and excitation of extraneous system resonances (Step & Direction Mode Only).

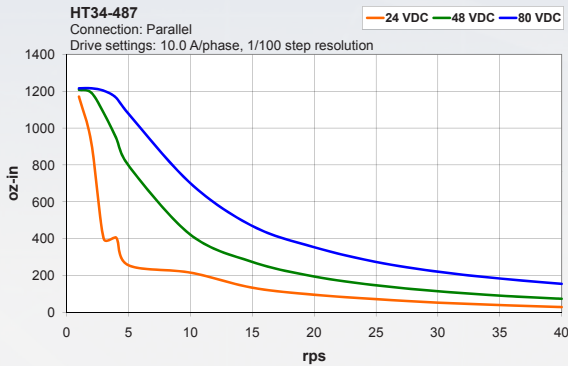
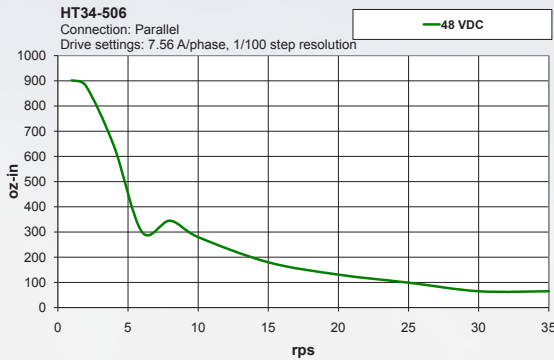
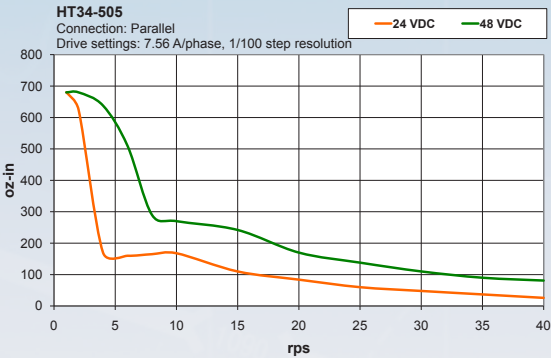
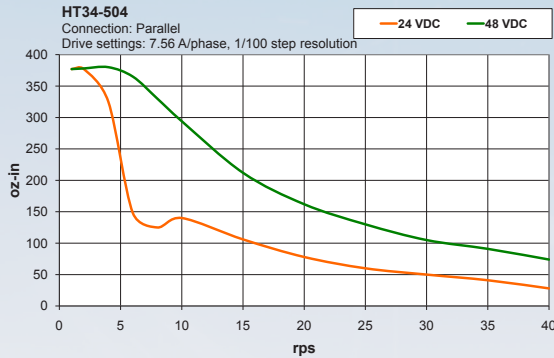
CONTROLLER: S Models

MODE OF OPERATION	Step & Direction, CW/CCW, A/B Quadrature, Oscillator, Joystick, SCL, Hub.
STEP AND DIRECTION INPUTS	Optically Isolated, Differential, 5 Volt. Minimum pulse width = 250 ns. Maximum pulse frequency = 2 MHz Function: Step & Direction, CW/CCW Step, A/B Quadrature, Run/Stop & Direction, Jog CW & CCW or CW & CCW Limits / Adjustable bandwidth digital noise rejection filter.
ENABLE INPUT	Optically Isolated, 5-12 Volt Function: Motor Enable, Alarm Reset or Speed Select (Oscillator Mode).
OUTPUT	Optically Isolated, 24V, 10mA MAX. Function: Fault, Motion, Tach.
ANALOG INPUT RANGE	0 to 5VDC
ANALOG INPUT RESOLUTION	12 bits
COMMUNICATION INTERFACE	RS-232 standard on all ST drives

ST5 - TORQUE CURVES

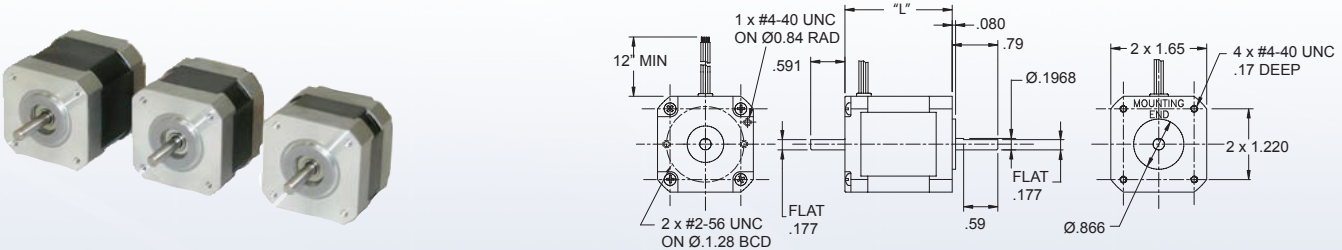


ST10 - TORQUE CURVES



Recommended Motors - a selection of motors suitable for use with the ST Drives, call for more options.

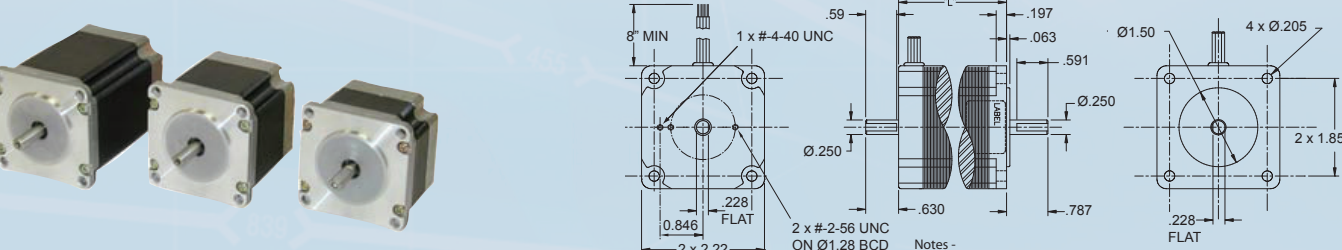
NEMA 17 - HIGH TORQUE



Part #	Connection	Motor Length inch/mm	Min-Holding Torque oz-in/Nm*	# of Leads	Step Angle (deg)	Amps#	Ohms	mH	Rotor Inertia g-cm ²	Motor Weight lbs
HT17-068/268	parallel	1.3/33	31.4/0.22	8	1.8	1.34	2.1	2.8 [2.5]	35 [38]	0.44
HT17-075/275	parallel	1.85/47	62.8/0.44	8	1.8	1.70	1.7	3.0 [2.5]	68 [82]	0.73

* Motor only rating. Motor rating for 268/275 shown in brackets if different.
optimal current setting in ST drive may differ.

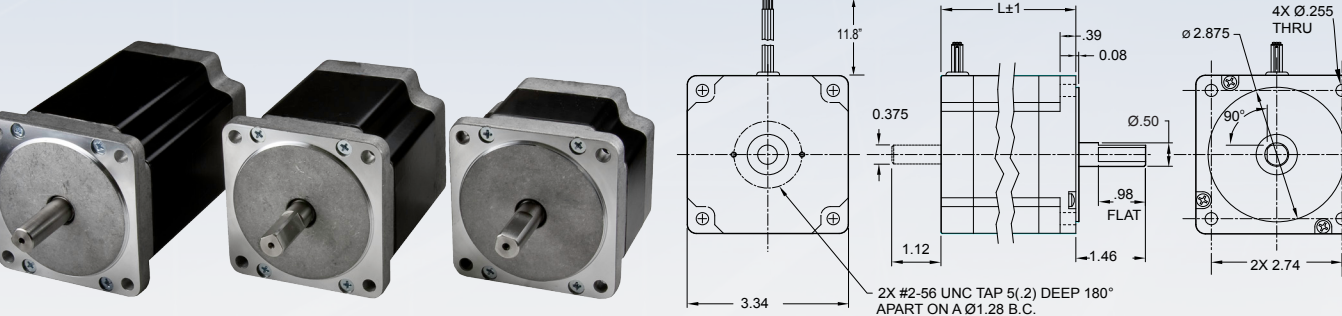
NEMA 23 - HIGH TORQUE



Part #	Connection	Motor Length (inch/mm)	Min-Holding Torque (oz-in/Nm)*	# of Leads	Step Angle (deg)	Amps#	Ohms	mH	Rotor Inertia g-cm ²	Motor Weight (lbs.)
HT23-394/594	parallel	1.54/39	76.6/0.54	8	1.8	2.83	0.7	1.4	120 [135]	1.00
HT23-401/601	parallel	2.99/76	264.0/1.86	8	1.8	4.24	0.5	1.6	480 [460]	2.20

* Motor only rating. Motor rating for 594/601 shown in brackets if different.
optimal current setting in ST drive may differ.

NEMA 34 - HIGH TORQUE



Part #	Connection	Motor Length (inch/mm)	Min-Holding Torque (oz-in/Nm)	# of Leads	Step Angle (deg)	Amps	Ohms	mH	Rotor Inertia g-cm ²	Motor Weight lbs.
HT34-474/504	parallel	2.61/66.3	389/2.74	8	1.8	6.3	0.24	1.9 [1.7]	1400 [1100]	4.00 [3.52]
HT34-476/505	parallel	3.78/96	849/6.0	8	1.8	6.3	0.33	3.0 [2.7]	2700 [1850]	6.20 [5.94]
HT34-478/506	parallel	4.96/126	1260/8.9	8	1.8	5.6	0.49	5.5	4000 [2750]	8.66 [8.4]
HT34-487**	parallel	6.14	1845/13	8	1.8	9.0	0.27	2.4	4800	11.9

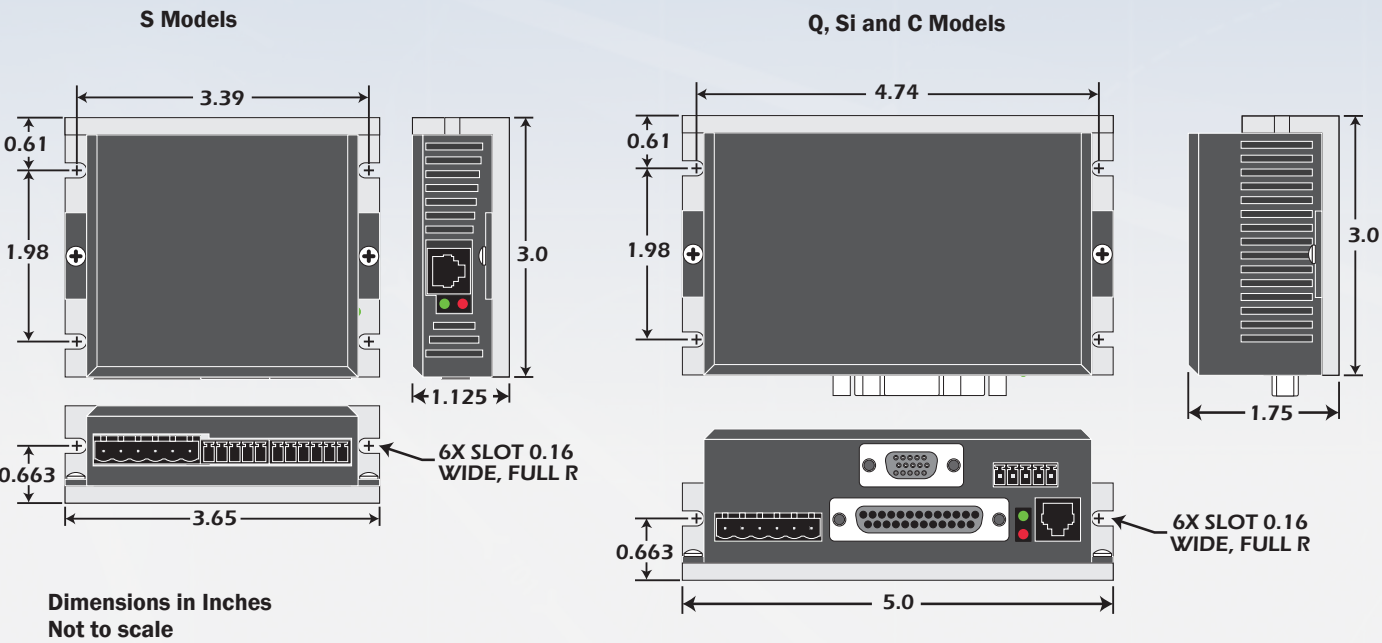
* Motor only rating. Motor rating for 504/505/506 shown in brackets if different.
** Dimensions for HT34-487 not shown. Refer to website
Optimal current setting in ST drive may differ.

Specifications (cont)

CONTROLLER: Q, Si, and C Models Only

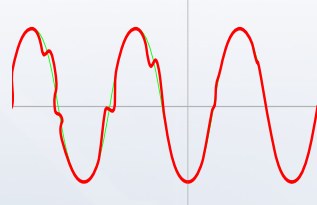
NON-VOLATILE STORAGE	Programs, data and drive configuration are saved in FLASH and EEPROM memory
INPUTS	X1, X2 Optically Isolated, differential, 5 volt. Minimum pulse width = 250 ns. Maximum pulse frequency = 2 MHz, Function: step & direction, CW/CCW step, A/B quadrature, encoder following, sensor, home or branch select X3 Optically isolated, 12 - 24V, sourcing or sinking, Function: motor enable, sensor, home or branch select X4 Optically isolated, 12 - 24V, sourcing or sinking, Function: alarm reset, sensor, home or branch select X5, X6 Optically isolated, 12 - 24V, sourcing or sinking, Function: jogging, sensor, home or branch select NOTE: Inputs X3 - X6 have a shared "Common" X7, X8 Optically isolated, differential, 12 - 24V Function: CW & CCW limits, sensor, home or branch select
OUTPUTS	Y1 Optical darlington, 30V, 100mA max, NPN/sinking. Function: brake or general purpose programmable. Y2 Optical darlington, 30V, 100mA max, NPN/sinking. Function: motion, tach or general purpose programmable Y3 Optical darlington, 30V, 100mA max, NPN/sinking. Function: fault or general purpose programmable. NOTE : Y1, Y2 & Y3 have a shared common. Y4 Optical darlington, 30V, 100mA max, configurable as sinking or sourcing. Function: general purpose program- mable
TWO ANALOG INPUTS	RANGE: Software selectable: 0-5V, ±5V, 0-10V, ±10V with configurable offset, deadband and filtering. RESOLUTION: 12 bits (with ±10V signal range) 11 bits (with 0-10V or ±5V signal range) 10 bits (with 0-5V signal range)
ENCODER OPTION	Employs encoder to provide stall detection and stall prevention with static position maintenance. Differential line receivers suitable rates to 2MHz
COMMUNICATION INTERFACE	ST-Q, Si: RS-232 for configuration, programming, and serial commands. optional RS-485or Ethernet for serial com- mands/networking ST-C: RS-232 for configuration, programming, and serial commands. CANopen for communications and control
AGENCY APPROVALS	RoHS, CE, EN 61800-3 :2004, EN 61800-5-1 :2003 (CE Pending on CANopen option)

Dimensions



Anti-Resonance/Electronic Damping

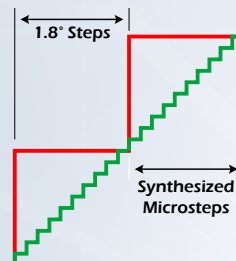
Step motor systems have a natural tendency to resonate at certain speeds. The ST drives automatically calculate the system's natural frequency and apply damping to the control algorithm. This greatly improves midrange stability, allows higher speeds and greater torque utilization, and also improves settling times.



Delivers better motor performance and higher speeds

Microstep Emulation

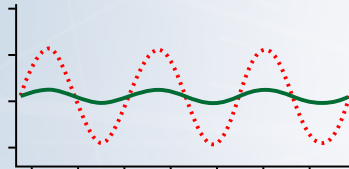
With Microstep Emulation, low resolution systems can still provide smooth motion. The drive can take low-resolution step pulses and create fine resolution micro-step motion.



Delivers smoother motion in any application

Torque Ripple Smoothing

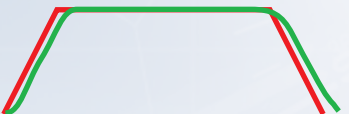
All step motors have an inherent low speed torque ripple that can affect the motion of the motor. By analyzing this torque ripple the system can apply a negative harmonic to negate this effect, which gives the motor much smoother motion at low speed.



Delivers smoother motion at lower speeds

Command Signal Smoothing

Command signal smoothing can soften the effect of immediate changes in velocity and direction, making the motion of the motor less jerky. An added advantage is that it can reduce the wear on mechanical components.



Delivers smoother system performance

Self Test & Auto Setup

At start-up the drive measures motor parameters, including the resistance and inductance, then uses this information to optimize the system performance. The drive can also detect open and short circuits.

Inputs & Outputs



3 digital inputs
1 digital output
1 analog input



8 digital inputs
4 digital outputs
2 analog inputs



8 digital inputs
4 digital outputs



8 digital inputs
4 digital outputs

CANopen

Option Boards

The following option boards are available with the ST drives (depending on version):

ST-Q with RS-485 and Encoder board.



Encoder Feedback

(Q, Si, and C versions)

Example: ST5-Si-NE

The Encoder Feedback option board provides Stall Detection and Stall Prevention functionality to the drive. Stall Detection detects the moment the motor has stalled and triggers a drive fault. Stall Prevention automatically senses rotor lag (just before stalling) and reduces motor speed to avoid stalling. Stall Prevention includes Position Maintenance, which maintains shaft position when the motor is stopped.

RS-485

(Q and Si versions)

Example: ST10-Q-RN

The RS-485 option board adds the ability to stream SCL commands to a drive, and in the case of Q drives, to connect multiple drives in a serial communications (SCL) network.

CANopen

(C versions only)

Example: ST5-C-CN

The CANopen option board used with ST-C drives allows the drive to be connected to a CANopen network along with other CANopen devices. Drives can be controlled and interrogated over the network.

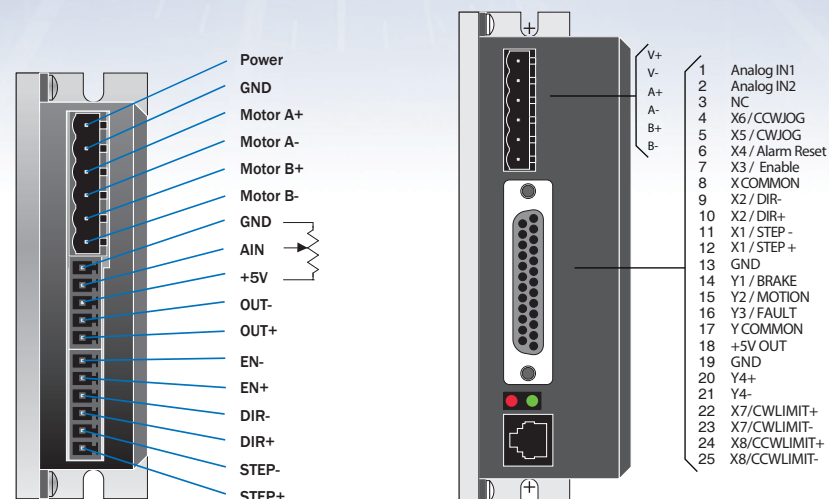


ST-C with CANopen and Encoder board.

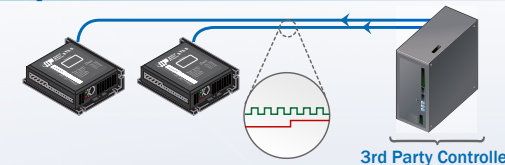
Q over CANopen

The ST drive with the CANopen option board has the ability to access, modify and trigger a Q program stored in the drive.

The user develops and downloads a program using the Q Programmer™ software via RS-232. The program sequences can then be triggered via the CANopen network, creating a powerful distributed motion control system.

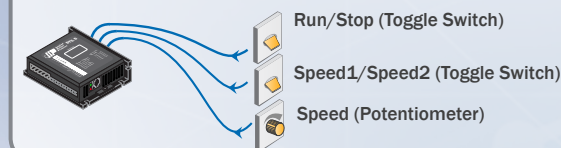


Step & Direction



- Step & Direction
- CW & CCW Pulse
- A/B Quadrature (Master Encoder)

Oscillator / Run-Stop

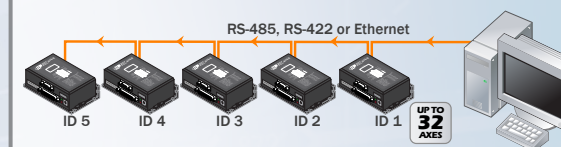


- Software Configuration
- Two Speeds
- Vary speed with analog input
- Joystick Compatible

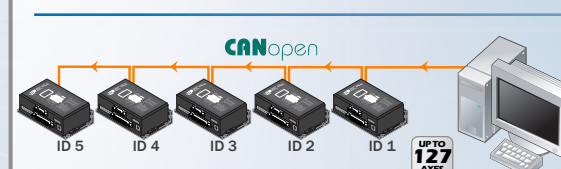
Host Control



- Accepts streaming commands from host PC or PLC

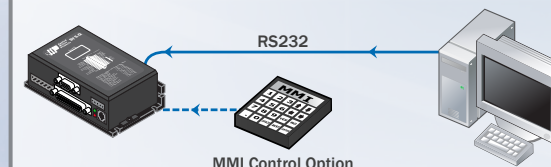


- Accepts streaming commands from host PC or PLC
- Up to 32 axes with RS-485 option
- 1000's of axes with Ethernet option

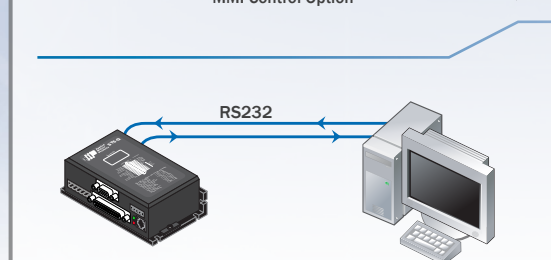


- Connect to CANopen network
- DS301 and DSP402 protocols
- Up to 127 axes

Stand-Alone Programmable

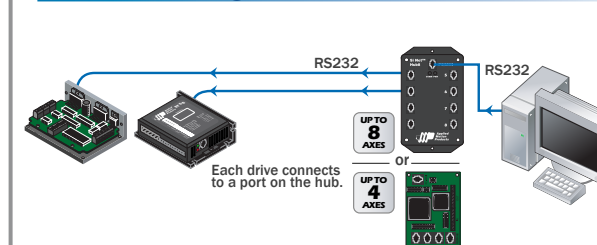


- Point & Click Graphical Interface
- MMI Option
- Download, store & execute programs



- Comprehensive text based language
- Download, store & execute programs
- High Level Features: Multi-Tasking, Conditional Programming, & Math Functions
- Host Interface While Executing Internal programs

Multi-axis Systems



Use SiNet Hub Programmer software to develop your sequence of events, then download them to a SiNet Hub for a stand-alone system or stream serial commands to the drives from a PC, PLC, HMI, or other host controller.