



**Applied
Motion
Products**

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Product Datasheet

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ST10-IP-EN

DC EtherNet/IP Advanced Microstep Drive

1pc. - 659.00
50pc. - 494.25



Product Features

- Programmable microstepping drive with advanced current control and built-in EtherNet/IP networking
- Full Q programming functionality with Q Programmer™ software
- 744 lines of stored program capability
- Math calculations using analog and digital parameters
- Access all commands and data registers from EtherNet/IP network
- Wide current range 0.1 to 10.0 A/phase (peak of sine) with idle current reduction
- Advanced anti-resonance algorithm
- Torque ripple smoothing
- Microstepping and Microstep Emulation
- 8 digital inputs, 4 digital outputs, optically isolated
- 2 analog inputs, +/-10 volt range
- Fast 10/100 Ethernet for programming and communications
- Also supports Ethernet UDP & TCP communication protocols



Description

The ST10-IP-EN stepper drive is a DC-powered microstepping drive for controlling two-phase, bipolar step motors. It offers advanced current control and a sophisticated 3rd generation anti-resonance algorithm that electronically dampens motor and system resonances to improve motor smoothness and usable torque over a wide speed range. The drive also employs electronic torque ripple smoothing and microstep emulation to greatly reduce motor noise and vibration. The drive must be powered from 24-80 VDC and can output up to 10.0 A/phase (peak-of-sine) to the step motor. Over-voltage, over-temperature and over-current protection features prevent damage while running in adverse conditions. The drive is complemented by a specifically matched set of NEMA 23 and NEMA 34 frame stepper motors (see Related and Recommended products below).

The ST10-IP-EN incorporates EtherNet/IP network communications, the widely used industrial protocol for manufacturing automation applications. With EtherNet/IP users can control, configure and query the drive using an open, standards-based, industrial Ethernet connection at speeds up to 100 Mbits/sec. The ST-IP drives run all of the same control modes as ST-Q drives, with the addition that all drive features can be accessed over EtherNet/IP, including more than 100 commands and 130 registers for controlling motion, I/O, configuration, polling, math, register manipulation, and Q programming.

For connecting to external devices such as control signals, incremental encoders, limit switches, proximity or photoelectric sensors, PLC I/O, lamps, and other devices, the drive comes with 8 digital inputs, 4 digital outputs, and 2 single-ended analog inputs (analog inputs can be wired together as 1 differential analog input). Adjustable digital filters are present on the digital inputs for enhanced reliability in noisy environments.

In addition to EtherNet/IP the drive supports Ethernet TCP and UDP protocols for sending commands from Applied Motion's proprietary Serial Command Language (SCL). The same 10/100 Mbit Ethernet port on the drive is also used for configuring and programming the drive using the [ST Configurator™](#) and [Q Programmer™](#) software applications, respectively.

All ST drives are CE approved and RoHS compliant.

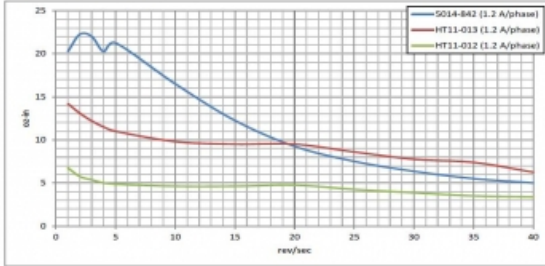
Specifications

Model Number:	ST10-IP-EN
Part Number:	5000-181
Supply Voltage:	24-80 VDC
Supply Voltage Type:	DC
Control Modes:	Streaming Commands Analog Positioning Encoder Following Q Programming EtherNet/IP
Output Current:	0.1-10.0 A/phase
Communication Ports:	Ethernet EtherNet/IP
Encoder Feedback:	No
Step Resolution:	Full Half Microstepping Microstep Emulation
Idle Current Reduction:	0-90%
Setup Method:	Software setup
Digital Inputs:	8
Digital Outputs:	4
Analog Inputs:	1 differential or 2 single-ended
Dimensions:	5.0 x 3.0 x 1.75 inches
Weight:	10.4 oz
Operating Temperature Range:	0-70 °C
Ambient Temperature Range:	0-55 °C
Ambient Humidity:	90% max, non-condensing
Status LEDs:	1 red, 1 green
Circuit Protection:	Short circuit Over-voltage Under-voltage Over-temp

Torque Curves

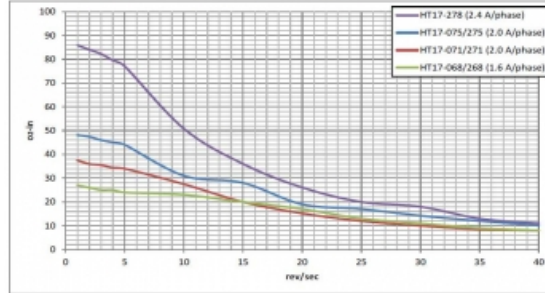
HT11-012, HT11-013, 5014-842

24 VDC power supply, 20000 steps/rev



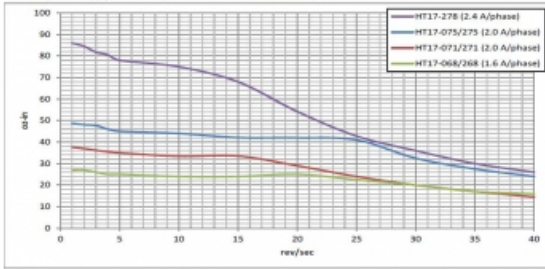
HT17

24 VDC power supply, 20000 steps/rev, all motors connected in parallel



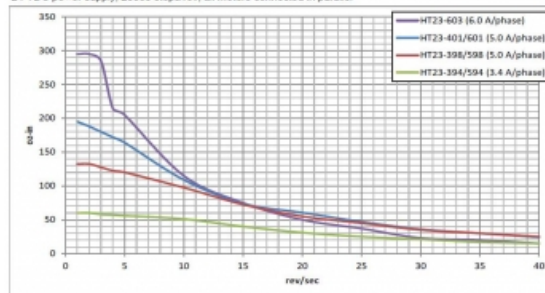
HT17

48 VDC power supply, 20000 steps/rev, all motors connected in parallel



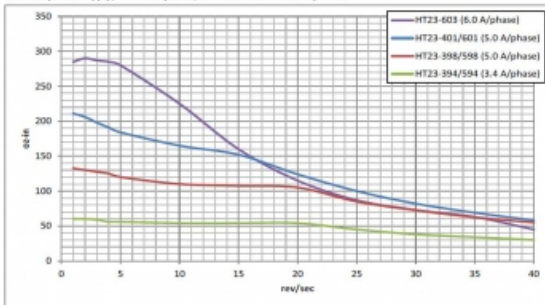
HT23

24 VDC power supply, 20000 steps/rev, all motors connected in parallel



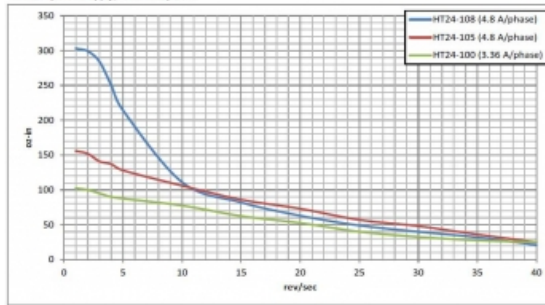
HT23

48 VDC power supply, 20000 steps/rev, all motors connected in parallel



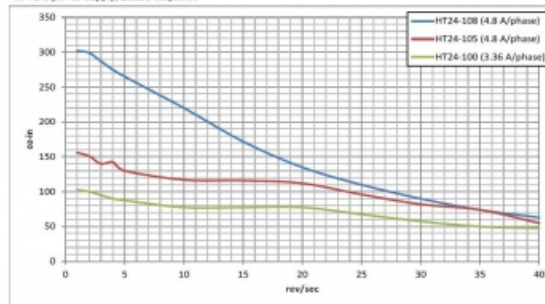
HT24

24 VDC power supply, 20000 steps/rev



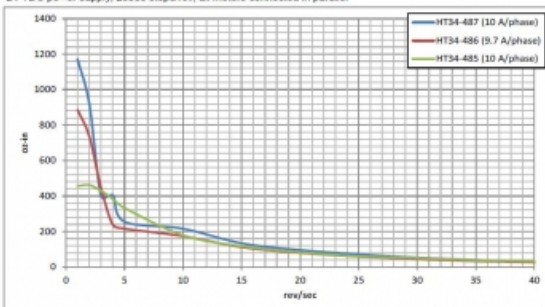
HT24

48 VDC power supply, 20000 steps/rev



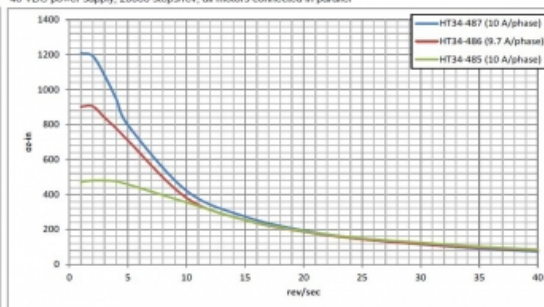
HT34-485/486/487 with ST10

24 VDC power supply, 20000 steps/rev, all motors connected in parallel



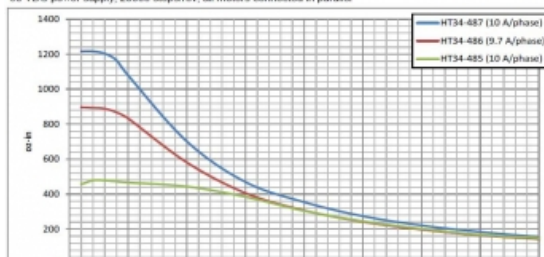
HT34-485/486/487 with ST10

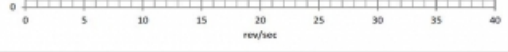
48 VDC power supply, 20000 steps/rev, all motors connected in parallel



HT34-485/486/487 with ST10

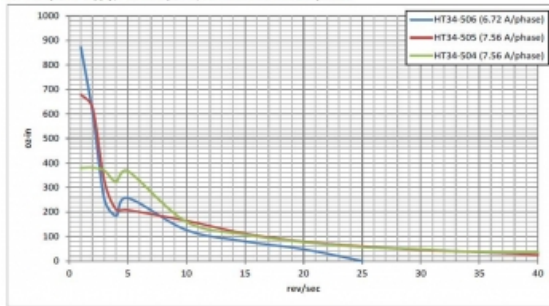
80 VDC power supply, 20000 steps/rev, all motors connected in parallel





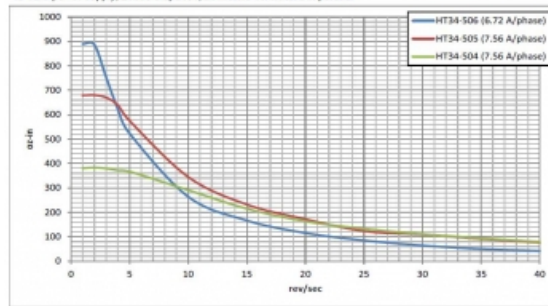
HT34-504/505/506 with ST10

24 VDC power supply, 20000 steps/rev, all motors connected in parallel



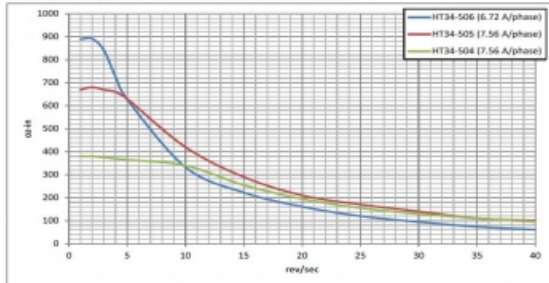
HT34-504/505/506 with ST10

48 VDC power supply, 20000 steps/rev, all motors connected in parallel



HT34-504/505/506 with ST10

60 VDC power supply, 20000 steps/rev, all motors connected in parallel








Software

Software:

[SCL Utility](#)
[ST Configurator™](#)

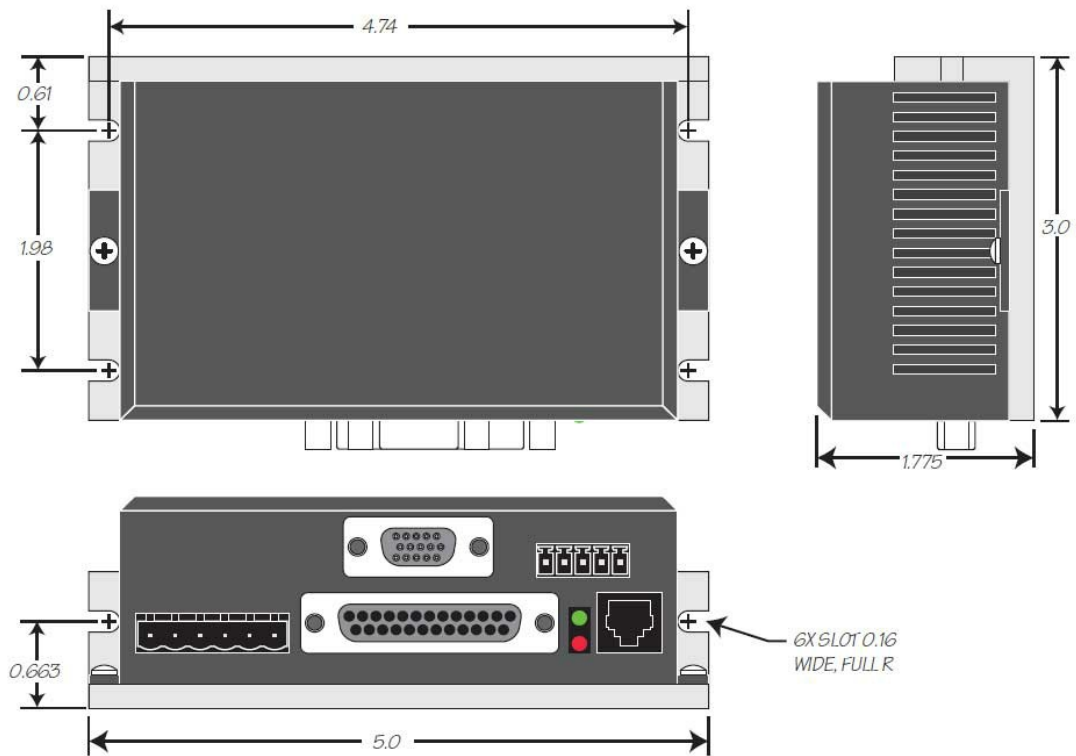
Downloads

Manuals:	 ST_IP_QuickSetup_920-0048C.pdf  Host Command Reference Rev I.pdf  ST5-10-QSi_Hardware Manual_920-0004F.pdf
Datasheet:	http://s3.amazonaws.com/applied-motion-pdf/ST10-IP-EN.pdf
Family Datasheet:	 ST_Datasheet_925-0007.pdf  EtherNet-IP-White-Paper_920-0050.pdf  EIP_EDS_FILES.zip
2D Drawing:	 ST5_10_Dimensions.pdf  ST_T_simple_3D.pdf
3D Drawing:	 ST5_10-Q_Si_C_SIMPLE.igs
Speed-Torque Curves:	 ST_speed-torque.pdf
Agency Approvals:	 ST-Q-Si-C-IP_CE_DOC.pdf
Application Notes:	 APPN0024_AOIs-for-RSLogix5000.zip  APPN0023_MicroLogix-to-EtherNet-IP-drive.zip  APPN0022_CompactLogix-to-EtherNet-IP-drive.zip  APPN0021_5V-Keepalive-Circuit.pdf  APPN0016_Simple-25-pin-mating-connections.pdf

Pricing

ST10-IP-EN Part No. 5000-181	
1pc.	\$659.00
25pc.	\$566.74
50pc.	\$494.25
100pc.	Contact us for 100+ piece pricing.

Mechanical Outline



Products in the Series *EtherNet/IP Products*

Model Number	Supply Voltage	Control Modes	Output Current	Communication Ports	Encoder Feedback	1pc./50pc.
	12-70 VDC	Step & Direction, Analog Torque / Velocity, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Velocity Control	NA	Ethernet, EtherNet/IP	Yes	\$575.00 / \$431.25
	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	No	\$551.00 / \$413.25
	12-70 VDC	Step & Direction, Analog Torque / Velocity, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Velocity Control	NA	Ethernet, EtherNet/IP	Yes	\$585.00 / \$438.75
	12-70 VDC	Step & Direction, Analog Torque / Velocity, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Velocity Control	NA	Ethernet, EtherNet/IP	Yes	\$595.00 / \$446.25
	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	Yes	\$605.00 / \$453.75
	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	No	\$495.00 / \$371.25
	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	Yes	\$650.00 / \$487.50
	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	No	\$540.00 / \$405.00
	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	Yes	\$706.00 / \$529.50
ST10-IP-EE	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	Yes	\$710.00 / \$532.50
ST10-IP-EN	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	No	\$659.00 / \$494.25
ST5-IP-EE	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	Yes	\$655.00 / \$491.25
ST5-IP-EN	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	No	\$607.00 / \$455.25
STAC5-IP-E120	94-135 VAC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.5-5.0 A/Phase	Ethernet, EtherNet/IP	Yes	\$710.00 / \$532.50
STAC5-IP-E220	94-265 VAC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.5-2.55 A/Phase	Ethernet, EtherNet/IP	Yes	\$710.00 / \$532.50
STAC5-IP-N120	94-135 VAC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.5-5.0 A/Phase	Ethernet, EtherNet/IP	No	\$659.00 / \$494.25
STAC5-IP-N220	94-265 VAC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.5-2.55 A/Phase	Ethernet, EtherNet/IP	No	\$659.00 / \$494.25
SV7-IP-EE	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	NA	\$597.00 / \$447.75
SVAC3-IP-E120	108-132 VAC	Streaming Commands, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	NA	\$710.00 / \$532.50
SVAC3-IP-E220	108-242 VAC	Streaming Commands, Q Programming, EtherNet/IP	NA	Ethernet, EtherNet/IP	NA	\$710.00 / \$532.50

Products in the Series *ST Stepper Drives*

Model Number ▾	Supply Voltage ▾	Control Modes ▾	Output Current ▾	Communication Ports ▾	Encoder Feedback ▾	1pc./50pc. ▾
ST10-C-CE	24-80 VDC	CANopen	0.1-10.0 A/Phase	RS-232, CANopen	Yes	\$682.00 / \$511.50
ST10-C-CN	24-80 VDC	CANopen	0.1-10.0 A/Phase	RS-232, CANopen	No	\$631.00 / \$473.25
ST10-IP-EE	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	Yes	\$710.00 / \$532.50
ST10-IP-EN	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	No	\$659.00 / \$494.25
ST10-Plus	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-10.0 A/Phase	RS-232	No	\$440.00 / \$330.00
ST10-Q-EE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-10.0 A/Phase	Ethernet	Yes	\$726.00 / \$544.50
ST10-Q-EN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-10.0 A/Phase	Ethernet	No	\$660.00 / \$495.00
ST10-Q-NE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	0.1-10.0 A/Phase	RS-232	Yes	\$580.00 / \$435.00
ST10-Q-NF	24-80 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control	0.1-10.0 A/Phase	RS-232	Yes	\$557.00 / \$417.75
ST10-Q-NN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	0.1-10.0 A/Phase	RS-232	No	\$515.00 / \$386.25
ST10-Q-RE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	0.1-10.0 A/Phase	RS-232, RS-485	Yes	\$690.00 / \$517.50
ST10-Q-RN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	0.1-10.0 A/Phase	RS-232, RS-485	No	\$630.00 / \$472.50
ST10-S	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	0.1-10.0 A/Phase	RS-232	No	\$405.00 / \$303.75
ST10-Si-NE	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	Yes	\$630.00 / \$472.50
ST10-Si-NF	24-80 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Si Programming, Q Programming, SiNet Hub Compatible, Velocity Control	0.1-10.0 A/Phase	RS-232	Yes	\$636.00 / \$477.00
ST10-Si-NN	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	No	\$580.00 / \$435.00
ST5-C-CE	24-48 VDC	CANopen	0.1-5.0 A/Phase	RS-232, CANopen	Yes	\$585.00 / \$438.75
ST5-C-CN	24-48 VDC	CANopen	0.1-5.0 A/Phase	RS-232, CANopen	No	\$541.00 / \$405.75
ST5-IP-EE	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	Yes	\$655.00 / \$491.25
ST5-IP-EN	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	No	\$607.00 / \$455.25
ST5-Plus	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-5.0 A/Phase	RS-232	No	\$346.00 / \$259.50
ST5-Q-EE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-5.0 A/Phase	Ethernet	Yes	\$614.00 / \$460.50
ST5-Q-EN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-5.0 A/Phase	Ethernet	No	\$564.00 / \$423.00
ST5-Q-NE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	0.1-5.0 A/Phase	RS-232	Yes	\$540.00 / \$405.00
ST5-Q-NF	24-48 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control	0.1-5.0 A/Phase	RS-232	Yes	\$530.00 / \$397.50
ST5-Q-NN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus	0.1-5.0 A/Phase	RS-232	No	\$467.00 / \$350.25

ST5-Q-RE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	0.1-5.0 A/Phase	RS-232, RS-485	Yes	\$625.00 / \$468.75
ST5-Q-RN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus	0.1-5.0 A/Phase	RS-232, RS-485	No	\$570.00 / \$427.50
ST5-S	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	0.1-5.0 A/Phase	RS-232	No	\$302.00 / \$226.50
ST5-Si-NE	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	Yes	\$579.00 / \$434.25
ST5-Si-NF	24-48 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Si Programming, Q Programming, SiNet Hub Compatible, Velocity Control	0.1-5.0 A/Phase	RS-232	Yes	\$606.00 / \$454.50
ST5-Si-NN	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	No	\$490.00 / \$367.50