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Product Datasheet

www.Applied-Motion.com

ST10-Plus

DC Advanced Microstep Drive w/ Q Programming



Product Features

- *Compact microstepping drive with advanced current control*
- *Q Programmer™ for robust motion control programming*
- *744 lines of stored program capability*
- *Math calculations using analog and digital parameters*
- *Supports all "S" drive control modes as well*
- *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*
- *3 digital inputs, 1 digital output, optically isolated*
- *1 analog input, 0-5 volt range*
- *RS-232 cable and mating connectors included*

Description

The ST10-Plus 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-Plus can operate in all of the same control modes as the S model (pulse & direction, velocity, streaming commands, SiNet Hub operation), plus it has the ability to run stand-alone Q programs stored in non-volatile memory. Q programs are created using the *Q Programmer™* software, which provides multi-tasking, math functions, conditional processing, data register manipulation, and more features in a robust yet simple text-based programming language. The drive is setup and configured using Applied Motion's *ST Configurator™* software. Preconfigured motor setup files included with *ST Configurator™* make it easy to set up the drive for optimum results.

For connecting to external devices such as step & direction control signals, incremental encoders, limit switches, proximity or photoelectric sensors, PLC I/O, lamps, and other devices, the drive comes with 3 digital inputs, 1 digital output, and 1 single-ended analog input. Adjustable digital filters are present on the digital inputs for enhanced reliability in noisy environments.

The drive comes with an RS-232 port for configuration, serial communications and programming.

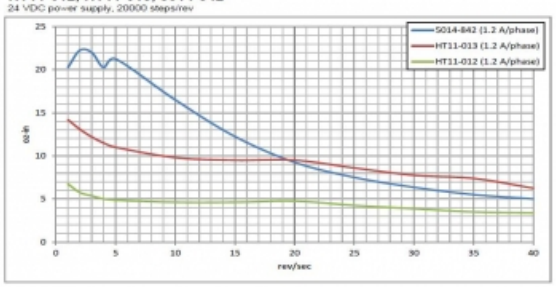
All ST drives are CE approved and RoHS compliant.

Specifications

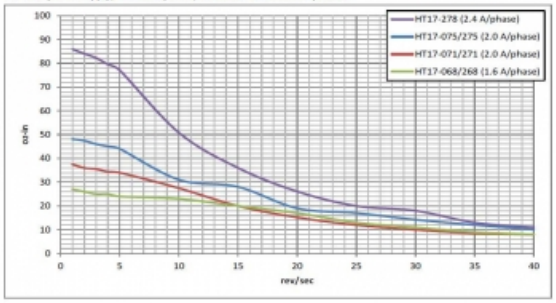
Model Number:	ST10-Plus
Part Number:	5000-149
Supply Voltage:	24-80 VDC
Supply Voltage Type:	DC
Control Modes:	Streaming Commands Analog Positioning Encoder Following Q Programming
Output Current:	0.1-10.0 A/phase
Communication Ports:	RS-232
Encoder Feedback:	No
Step Resolution:	Full Half Microstepping Microstep Emulation
Idle Current Reduction:	0-90%
Setup Method:	Software setup
Digital Inputs:	3
Digital Outputs:	1
Analog Inputs:	1
Dimensions:	3.65 x 3 x 1.125 inches
Weight:	7.1 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

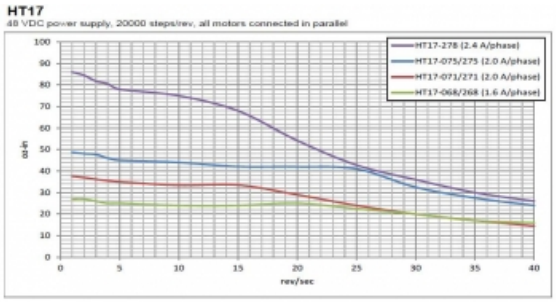
HT11-012, HT11-013, 5014-842
24 VDC power supply, 20000 steps/rev



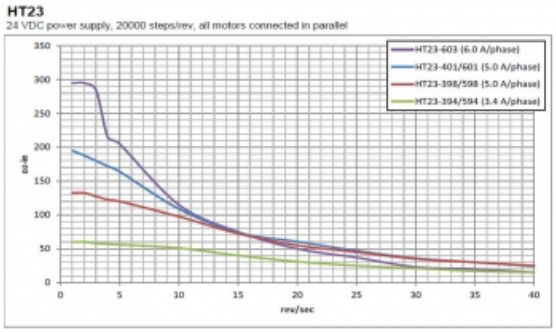
HT17
24 VDC power supply, 20000 steps/rev, all motors connected in parallel



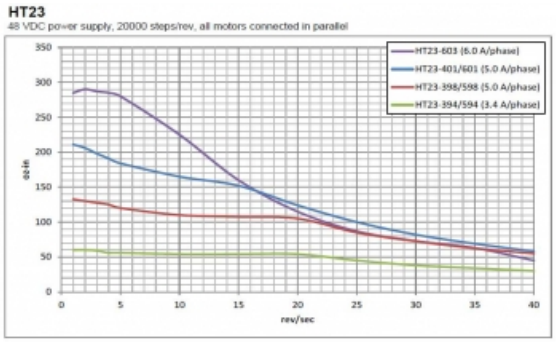
HT17
48 VDC power supply, 20000 steps/rev, all motors connected in parallel



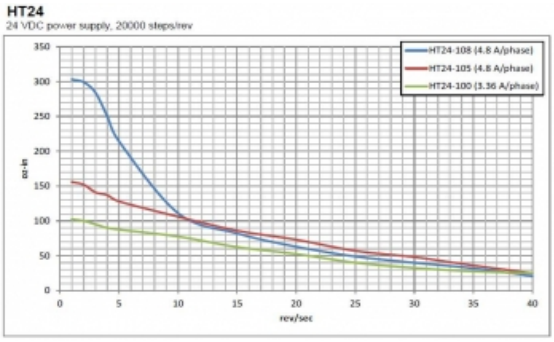
HT23
24 VDC power supply, 20000 steps/rev, all motors connected in parallel



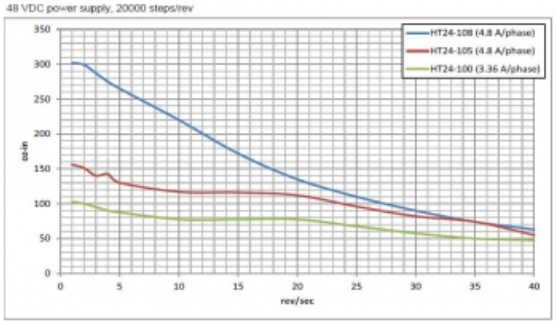
HT23
48 VDC power supply, 20000 steps/rev, all motors connected in parallel



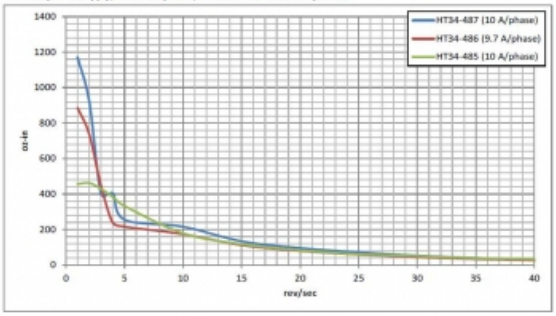
HT24
24 VDC power supply, 20000 steps/rev



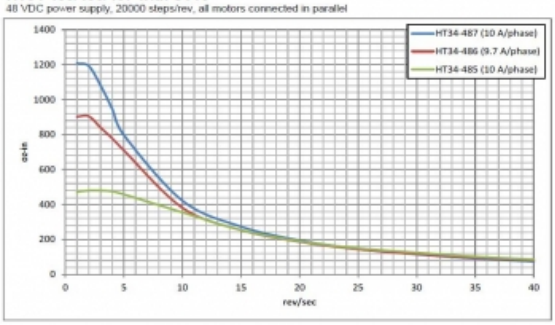
HT24
48 VDC power supply, 20000 steps/rev



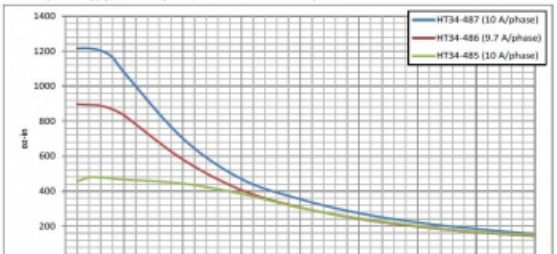
HT34-485/486/487 with ST10
24 VDC power supply, 20000 steps/rev, all motors connected in parallel

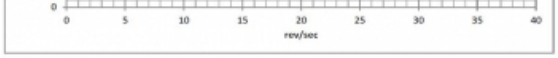


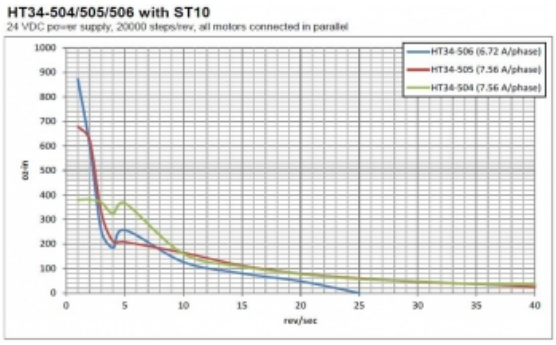
HT34-485/486/487 with ST10
48 VDC power supply, 20000 steps/rev, all motors connected in parallel

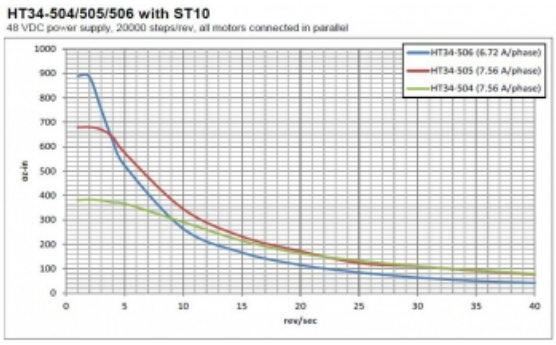


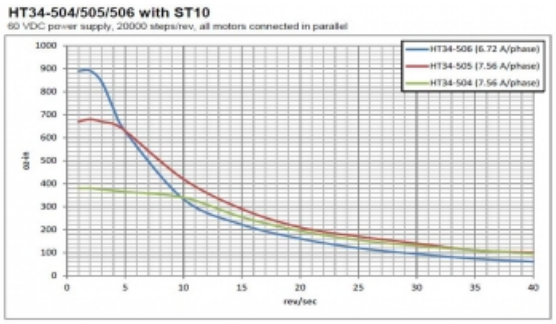
HT34-485/486/487 with ST10
80 VDC power supply, 20000 steps/rev, all motors connected in parallel











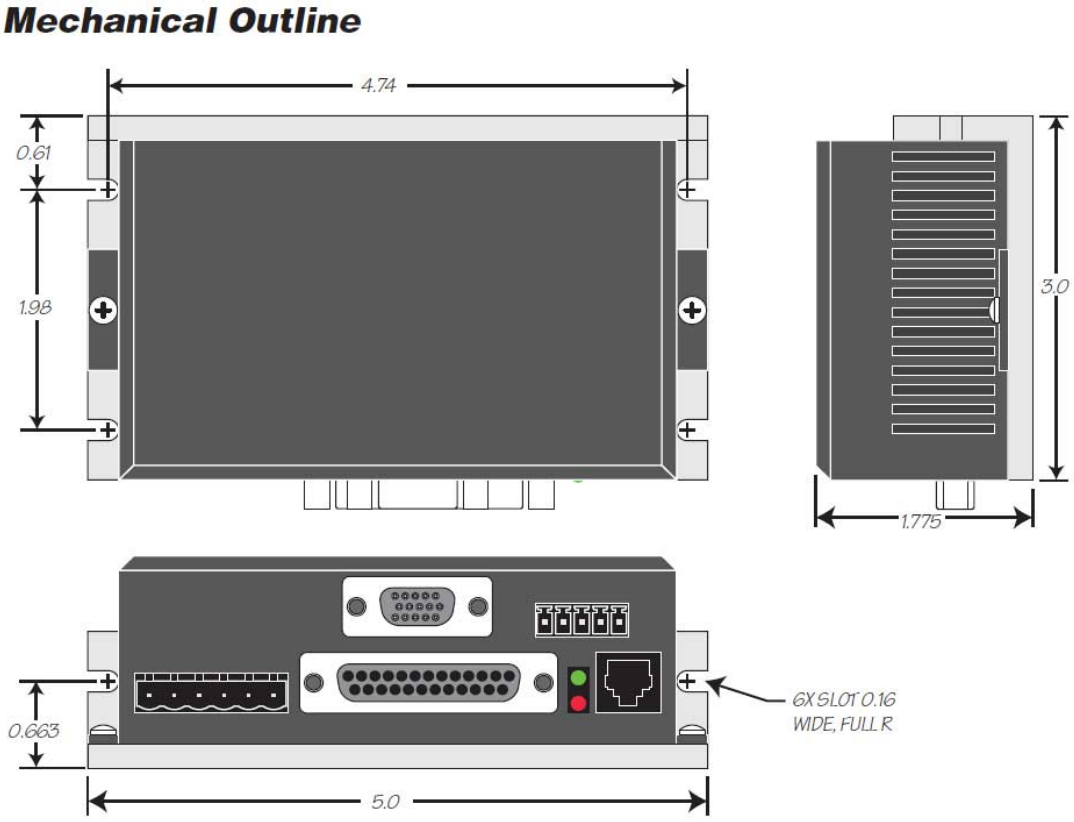
Software

Software:	SCL Utility ST Configurator™
Sample Code:	scldemo.zip

Downloads

Manuals:	ST5-10-S_C_HardwareManual__920-0027_RevD-opt-.pdf ST5_10_Plus_QuickSetupGuide_920-0005D.pdf Host-Command-Reference_920-0002R.pdf
Product PDF - S3 Link:	http://s3.amazonaws.com/applied-motion-pdf/ST10-Plus.pdf
Datasheet:	ST-Datasheet_925-0007.pdf
2D Drawing:	ST5-10-All_Dimensions.pdf
3D Drawing:	ST10-Q-S-Plus_SIMPLE_MODEL_B.igs
Speed-Torque Curves:	ST_Speed_Torque_revF.pdf
Agency Approvals:	ST10-S_Plus_LVD_CE_DOC.pdf ST5_10-S_Plus_EMC_CE_DOC.pdf
Application Notes:	APPN0026B-LabVIEW-communication-using-streaming-commands.zip APPN0019_Analog-positioning-using-Q-program.zip APPN0018_EZ-Series-Touchpanel-HMI.zip APPN0015_Make-a-serial-programming-cable.pdf

2D Drawings



Products in the Series *ST Stepper Drives*

Model Number	Supply Voltage	Control Modes	Output Current	Communication Ports	Encoder Feedback	1pc.
ST10-C-CE	24-80 VDC	CANopen	0.1-10.0 A/Phase	RS-232, CANopen	Yes	$818.00
ST10-C-CN	24-80 VDC	CANopen	0.1-10.0 A/Phase	RS-232, CANopen	No	$757.00
ST10-IP-EE	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	Yes	$852.00
ST10-IP-EN	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	No	$791.00
ST10-Plus	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-10.0 A/Phase	RS-232	No	$322.00
ST10-Q-EE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-10.0 A/Phase	Ethernet	Yes	$871.00
ST10-Q-EN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-10.0 A/Phase	Ethernet	No	$792.00
ST10-Q-NE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control, Modbus RTU	0.1-10.0 A/Phase	RS-232	Yes	$696.00
ST10-Q-NF	24-80 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control, Modbus RTU	0.1-10.0 A/Phase	RS-232	Yes	$668.00
ST10-Q-NN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	0.1-10.0 A/Phase	RS-232	No	$618.00
ST10-Q-RE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-10.0 A/Phase	RS-232, RS-485	Yes	$828.00
ST10-Q-RN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-10.0 A/Phase	RS-232, RS-485	No	$756.00
ST10-S	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	0.1-10.0 A/Phase	RS-232	No	$274.00
ST10-Si-NE	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	Yes	$756.00
ST10-Si-NF	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	Yes	$763.00
ST10-Si-NN	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	No	$696.00
ST5-C-CE	24-48 VDC	CANopen	0.1-5.0 A/Phase	RS-232, CANopen	Yes	$702.00
ST5-C-CN	24-48 VDC	CANopen	0.1-5.0 A/Phase	RS-232, CANopen	No	$649.00
ST5-IP-EE	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	Yes	$786.00

ST5-IP-EN	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	No	$728.00
ST5-Plus	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-5.0 A/Phase	RS-232	No	$295.00
ST5-Q-EE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-5.0 A/Phase	Ethernet	Yes	$737.00
ST5-Q-EN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-5.0 A/Phase	Ethernet	No	$677.00
ST5-Q-NE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	0.1-5.0 A/Phase	RS-232	Yes	$648.00
ST5-Q-NF	24-48 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control, Modbus RTU	0.1-5.0 A/Phase	RS-232	Yes	$636.00
ST5-Q-NN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	0.1-5.0 A/Phase	RS-232	No	$560.00
ST5-Q-RE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-5.0 A/Phase	RS-232, RS-485	Yes	$750.00
ST5-Q-RN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-5.0 A/Phase	RS-232, RS-485	No	$684.00
ST5-S	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	0.1-5.0 A/Phase	RS-232	No	$247.00
ST5-Si-NE	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	Yes	$695.00
ST5-Si-NF	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	Yes	$727.00
ST5-Si-NN	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	No	$588.00