STEPPER DRIVES

PERFORMANCE STEPPER DRIVES WITH ADVANCED FEATURES AND CONTROL OPTIONS

NEW®

ST Series

MADE IN USA CE RoHS

Configuration Software Included!

ST5-S shown close to actual size.

- Current Output 0.5 to 10.0 A
- Configurator™ Configuration Software
- Configurable Idle Current Reduction
- External Control Options
- Pulse and Direction
- Analog Command Signal
- Host Command Via RS232/485
- Fault Protection (Over-Voltage, Under-Voltage, Over-Temp, External Output Shorts, Internal Amplifier Shorts)
- Multi-Axis System with SiNet™ Hub
- Stand-Alone Programming on Si Model
- Microstepping Emulation (Up to 51200 steps/revolution)

Advanced Features

- Auto Setup: Measures Motor Parameters and Configures Tuning Parameters
- Self-Test: Detects Encoder and Determines Resolution; Diagnoses Miswires and Open Phases
- Torque Ripple Smoothing: Smoother Motion at Lower Speeds
- Command Signal Smoothing: Assures Smooth Acceleration/ Deceleration Ramps
- Anti-Resonance: Eliminates Mid-Range Instability; Allows Stable Operation to 50 rps or Greater

SPECIFICATIONS

ST5-S, ST5-Si POWER AMPLIFIER SECTION

Amplifier Type: MOSFET, Dual H-Bridge, 4 Quadrant
Current Control: 4 state PWM at 20 KHz
Output Current: 0.5 to 5.0 A/phase in 0.01 A increments
Power Supply: External 24 to 48 Vdc power supply required
Input Voltage Range: 18 to 53 Vdc
Protection: Over voltage, under voltage, over-temp, external output shorts (phase-to-phase, phase-to-ground), internal amplifier shorts
Idle Current Reduction: Reduction to any integer percent of full-current after delay selectable in milliseconds

ST10-S, ST10-Si POWER AMPLIFIER SECTION

Amplifier Type: MOSFET, Dual H-Bridge, 4 Quadrant
Current Control: 4 state PWM at 20 KHz
Output Current: 0.5 to 10.0 A/phase in 0.01 A increments
Power Supply: External 24 to 80 Vdc power supply required
Input Voltage Range: 18 to 88 Vdc
Protection: Over voltage, under voltage, over-temp, external output shorts (phase-to-phase, phase-to-ground), internal amplifier shorts
Idle Current Reduction: Reduction to any integer percent of full-current after delay selectable in milliseconds

-S AND -SI (COMMON FEATURES) CONTROLLER SECTION

Mode of Operation: Step and direction, CW/CCW, encoder following, oscillator, joystick, SCL, Si (Si programming is only available on the -Si models)
Microstep Resolution: Software selectable from 200 to 51,200 steps/rev in increments of 200 steps/rev
Speed Range: Depends upon selected resolution; amplifier is suitable for speeds up to 50 rps
Anti-Resonance: Raises the system damping ratio to eliminate mid-range instability and allows stable operation to 50 rps
Waveform: 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
Dymanic Smoothing: Software configurable filtering (4th order, elliptic) for use in removing spectral components from the command sequence; reduces jerk and excitation of extraneous system resonances
Encoder Option: Employs encoder (high or low resolution) to provide stall detection, stall prevention and perform position verification and maintenance

Communnication Interface: RS232; RS485 option available for Si models
Ambient Temperature: 0 to 55°C (32 to 158°F)
Humidity: 90% non-condensing

-Si CONTROLLER SECTION

Non-Volatile Storage: Program and drive configuration are saved in EEPROM memory

INPUTS

X1, X2: Optically isolated, differential, 5V; minimum pulse width = 250 ns; maximum pulse frequency = 2 MHz
Function: Step and direction, encoder following, sensor, home or branch select
X3: Optically isolated, 12 to 24V, sourcing or sinking, shares common with X3-X6
Function: Motor enable, sensor, home or branch select
X4: Optically isolated, 12 to 24V, sourcing or sinking, shares common with X3-X6
Function: Alarm reset, sensor, home or branch select
X5, X6: Optically isolated, 12 to 24V, sourcing or sinking, shares common with X3-X6
Function: Jogging, sensor, home or branch select
X7, X8: Optically isolated, differential, 12 to 24V
Function: CW and CCW limits, sensor, home or branch select

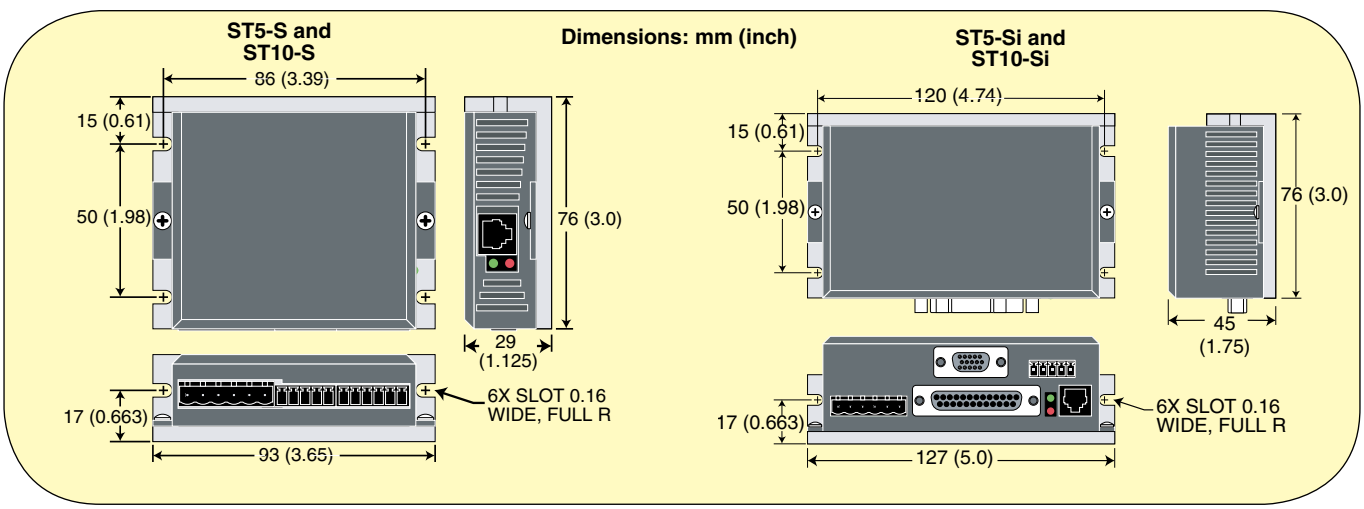
OUTPUTS

Y1: Optical darlington, 30V, 100 mA max, NPN/sinking, shared common with Y2 and Y3
Function: Brake or general purpose programmable
Y2: Optical darlington, 30V, 100 mA max, NPN/sinking, shared common with Y1 and Y3
Function: Motion, tach or general purpose programmable
Y3: Optical darlington, 30V, 100 mA max, NPN/sinking, shared common with Y1 and Y2
Function: Fault or general purpose programmable
Y4: Optical darlington, 30V, 100 mA max, configurable as sinking or sourcing
Function: General purpose programmable

Analog Inputs (2):
Range: Software selectable: 0 to 5V, ±5V, 0 to 10V, ±10V
Resolution:
12 bits (±10V signal range)
11 bits (0 to 10V or ±5V signal range)
10 bits (0 to 5V signal range)
Encoder: Differential line receivers suitable for 200 KHz or greater

-S CONTROLLER SECTION

Non-Volatile Storage: Configurations are saved in FLASH memory aboard the DSP
Step and Direction Inputs: Optically isolated, differential, 5V; minimum pulse width = 250 ns; maximum pulse frequency = 2 MHz
Function: Step and direction, run/stop and direction or CW and CCW Limits
Enable Input: Optically isolated, 5 to 12V
Function: Motor enable, speed select or alarm reset
Output: Optically Isolated, 24V, 10 mA max
Function: Fault, motion, tach, or brake
Analog Input: 0 to 5V, 12 bits resolution



SOFTWARE ST CONFIGURATOR™

Software Included Free with Purchase of ST Drives!

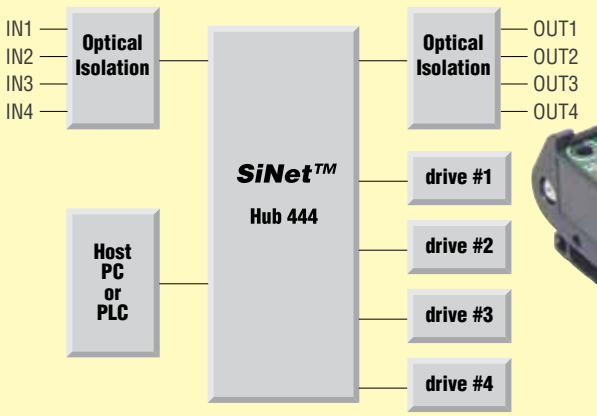
- **Simple Drive Setup**
- **Store and Download Configurations**

ACCESSORIES

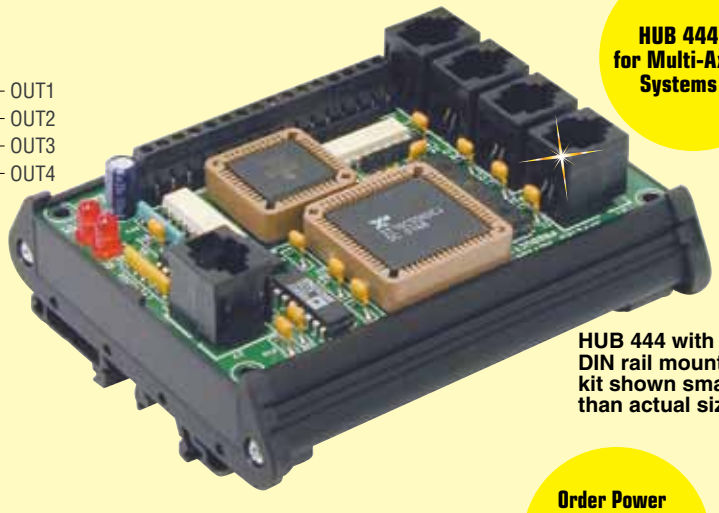
Multi-Axis Systems

Connect up to 4 drives on a mult-axis system using SiNet™ Hub 444. Use SiNet Hub Programmer™ software to develop your sequence of events, then download to the hub for a stand-alone system or send serial commands to the drives from a PC, PLC, HMI, or other host controller.

Order HUB 444 Separately. See omega.com



HUB 444 for Multi-Axis Systems



HUB 444 with DIN rail mounting kit shown smaller than actual size.

Order Power Supplies Separately. See omega.com

RECOMMENDED POWER SUPPLIES (ORDER SEPARATELY)
ST5-S and –Si: OMPS150A24, 24 Vdc at 6.3 A. See omega.com for details.
ST10-S and –Si: OMPS300A48, 48 Vdc at 6.7 A. See omega.com for details.

FUSING
Internal Fuse: ST5 and ST10 contain internal 10 A fast acting fuses

OMRC-050 Regen Clamp—For Stepper Drive Power Supply Protection

- Voltage Range 24 to 80 Vdc
- 50 W Power Dissipation
- Regen Present LED
- Power LED
- 76 x 102 x 6.4 mm (3 x 4 x 2.5")

Order OMRC-050 Separately. See omega.com

OMRC-050 shown smaller than actual size.

SPECIFICATIONS

Input Power Cont: 50 W
Input Power Peak: 800 W
Voltage Range: 24 to 80 Vdc

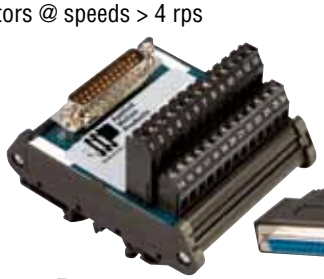
Recommended When Using:

NEMA 17 motors @ speeds > 30 rps
NEMA 23 motors @ speeds > 10 rps
NEMA 34 motors @ speeds > 4 rps

OMBOB-1 Breakout Box for I/O Connector

- Break out DB-25 I/O Connector to Screw Terminals
- Includes 1 m (3') Cable
- Compatible with ST5-Si and ST10-Si

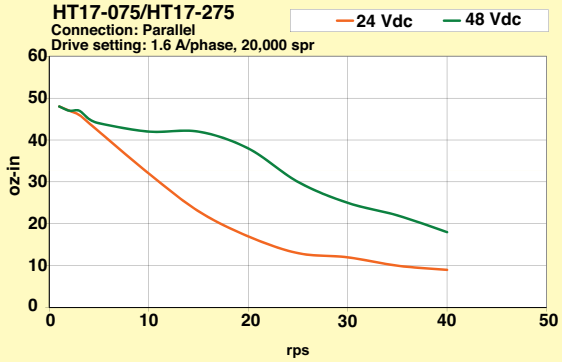
OMBOB-1 shown smaller than actual size.



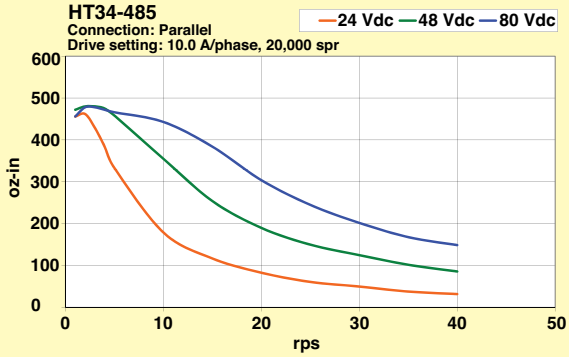
Great for prototyping systems!

TORQUE-SPEED CURVES

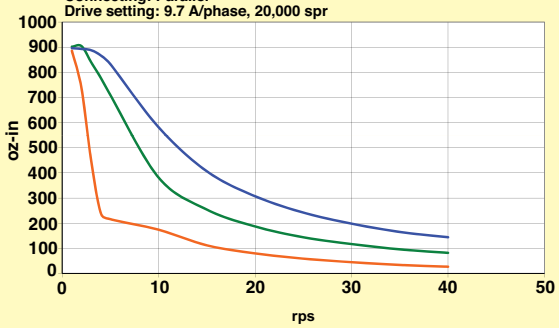
ST5
HT17-075/HT17-275
Connection: Parallel
Drive setting: 1.6 A/phase, 20,000 spr



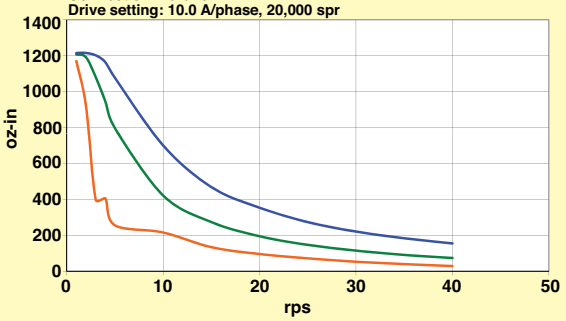
ST10
HT34-485
Connection: Parallel
Drive setting: 10.0 A/phase, 20,000 spr



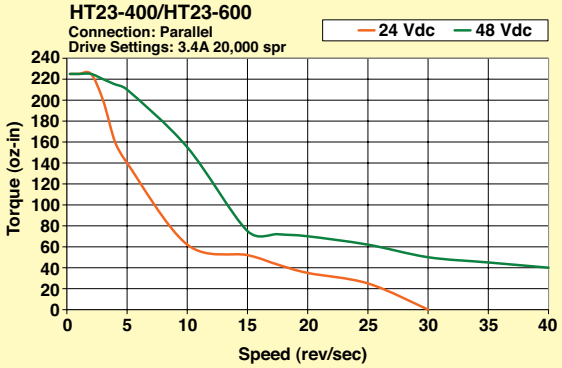
ST10
HT34-486
Connecting: Parallel
Drive setting: 9.7 A/phase, 20,000 spr



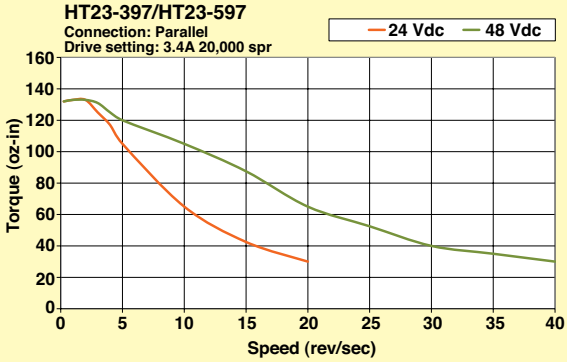
ST10
HT34-487
Connection: Parallel
Drive setting: 10.0 A/phase, 20,000 spr

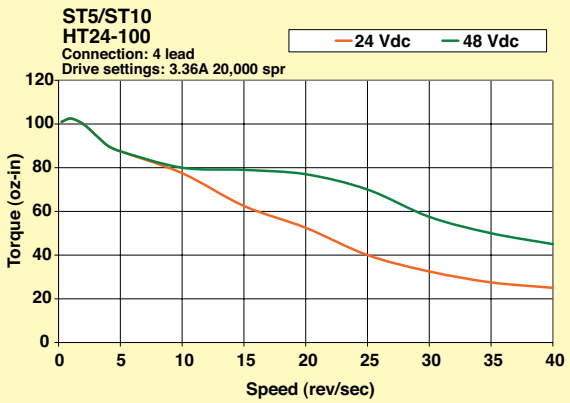


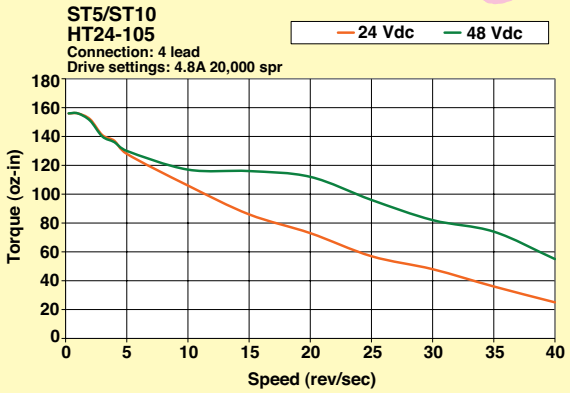
ST5
HT23-400/HT23-600
Connection: Parallel
Drive Settings: 3.4A 20,000 spr

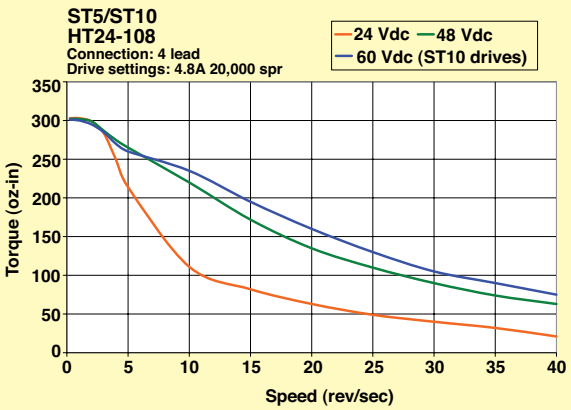


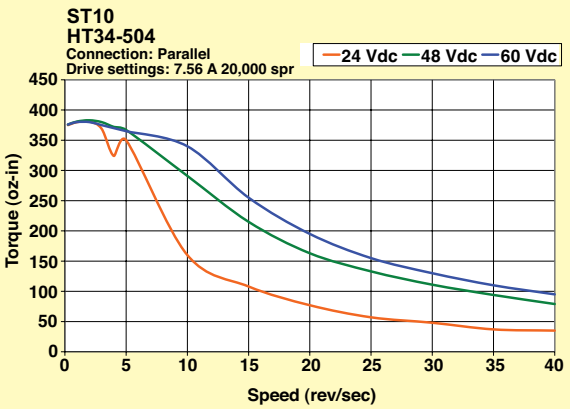
ST5
HT23-397/HT23-597
Connection: Parallel
Drive setting: 3.4A 20,000 spr

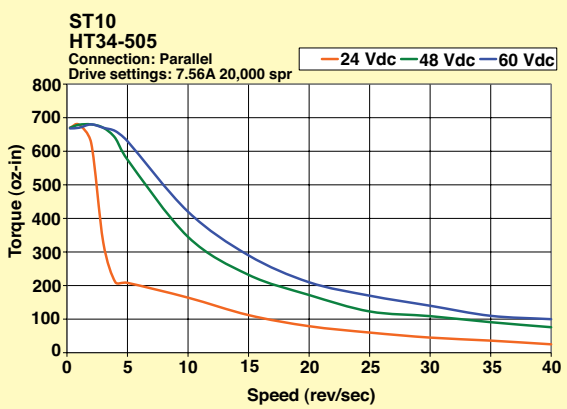


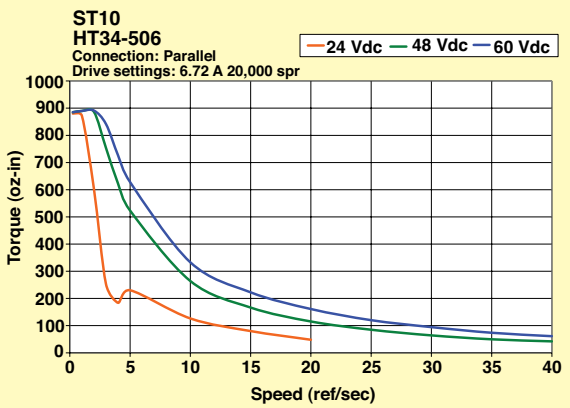












To Order *Visit omegamation.com/st_series for Pricing and Details*

MODEL NO.	DESCRIPTION
ST5-S	Performance stepper drive with 5 A output
ST5-Si	Performance stepper drive with Si Programmer™
ST5-Si-485	Performance stepper drive with Si Programmer™ and RS485 option
ST5-Si-ENC	Performance stepper drive with Si Programmer™ and encoder option
ST5-Si-ENC-485	Performance stepper drive with Si Programmer™ and encoder plus RS485 options
ST10-S	Performance stepper drive with 10 A output
ST10-Si	Performance stepper drive with Si Programmer™
ST10-Si-485	Performance stepper drive with Si Programmer™ and RS485 option
ST10-Si-ENC	Performance stepper drive with Si Programmer™ and encoder option
ST10-Si-ENC-485	Performance stepper drive with Si Programmer™ and encoder plus RS485 options

Note: *Software and download cable included.*
Ordering Example: ST5-S, *performance stepper drive with 5 A output.*

RECOMMENDED MOTORS FOR ST5

MODEL NO.	DESCRIPTION
OMHT17-275	NEMA 17, 62.3 oz-in holding torque
OMHT24-100	NEMA 24, 123 oz-in holding torque
OMHT23-597	NEMA 23, 177 oz-in holding torque
OMHT24-105	NEMA 24, 177 oz-in holding torque
OMHT17-075	NEMA 17, 62.8 oz-in holding torque
OMHT23-600	NEMA 23, 264.8 oz-in holding torque
OMHT23-397	NEMA 23, 177 oz-in holding torque
OMHT24-108	NEMA 24, 354 oz-in holding torque
OMHT23-400	NEMA 23, 264 oz-in holding torque

***Ordering Example: ST5-Si**, performance stepper drive with Si Programmer™, and **OMHT17-075,** NEMA 17 high torque step motor. See omegamation.com for more motor specs. Torque-speed curves for recommended motor shown above.*

RECOMMENDED MOTORS FOR ST10

MODEL NO.	DESCRIPTION
OMHT24-100	NEMA 24, 123 oz-in holding torque
OMHT24-105	NEMA 24, 177 oz-in holding torque
OMHT24-108	NEMA 24, 354 oz-in holding torque
OMHT-34-504	NEMA 34, 396 oz-in holding torque
OMHT34-485	NEMA 34, 650 oz-in holding torque
OMHT34-505	NEMA 34, 849 oz-in holding torque
OMHT-34-506	NEMA 24, 123 oz-in holding torque
OMHT34-486	NEMA 34, 1200 oz-in holding torque
OMHT34-487	NEMA 34, 1845 oz-in holding torque

***Ordering Example: ST10-Si,** performance stepper drive with Si Programmer™, and **OMHT34-487**, NEMA 34 high torque step motor.*

ACCESSORIES

MODEL NO.	DESCRIPTION
ENC-ST-CA-10	Encoder cable for ST drive, 3 m (10')
OMBOB-1	Breakout box for I/O connector
OMPS150A24	Stepper drive power supply for ST5 series, 24 Vdc, 6.3 A
OMPS300A48	Stepper drive power supply for ST10 series, 48 Vdc, 6.7 A
OM-CONV-USB	USB to RS232 interface converter
OMRC-050	Motor regeneration clamp
POWER CORD-SE	AC power cord with stripped end termination
OM-PL-USBS	USB to RS232 converter; works with Windows Vista and Windows 7
OMG-USB-485-1	USB to RS422/485/530 interface converter; USB-A to DB25-male DB25F/9M cable (DRB RS422 pinout)
OMG-CA175	DB25F/9M cable (DB9 RS422 pinout)
SI-PROG-CBL	Replacement programming cable (comes with drive)
DRIVE-CBL	Replacement MMI and/or HUB communications cable (comes with MMI-01 and HUB 444)
DSUB-9-MF	DIN rail interface module, 9-pin
DSUB-25-MF	DIN rail interface module, 25-pin
DSUB-9-MF-CBL	DSUB cable, 9-pin, 2 m (6.6'), male/female connectors
DSUB-25-MF-CBL	DSUB cable, 25-pin, 2 m (6.6'), male/female connectors

***Ordering Example: ST10-Si-ENC-485,** 10 A performance stepper drive with Si programmer plus encoder and RS485 options, **ENC-ST-CA-10,** 3 m (10') encoder cable for ST drive, and **OMBOB-1,** breakout box for I/O connector.*