

STM23 Integrated Steppers

NEMA 23 Integrated Drive+Motor with Multiple Control Options



Product Features

- *Step motor and drive in one package*
- *Sophisticated current control*
- *Anti-resonance*
- *Torque ripple smoothing*
- *Microstep emulation*
- *NEMA 23 frame size*
- *Multiple control options*
- *Multiple communication options including Ethernet, EtherNet/IP, RS-232, RS-485 and CANopen*
- *Optional encoders to provide enhanced, closed-loop functionality*

Series Details:

STM integrated steppers are drive+motor units, fusing step motor and drive components into a single device. This space-saving design eliminates wiring and saves on cost over conventional motor and drive solutions.

The STM23 integrated steppers combine high torque NEMA 23 step motors with a sophisticated, 5.0 A/phase (peak-of-sine) step motor drive. Power to the drive, located at the rear of the motor, must be supplied by an external DC supply. Applied Motion offers compatible 24 and 48 volt DC [power supplies](#) for exactly this purpose.

All STM23 integrated steppers are RoHS and CE compliant.

Note: CE compliance is pending on the STM23R versions.

Control Options:

The STM23 integrated steppers come with the choice of five control options: R, S, Q, IP and C.

- The “R” control option means the drive operates in step & direction control mode. This includes step (pulse) & direction and CW/CCW pulse (pulse-pulse) signal types. The R control option is designed for use with an external controller that provides one of these pulse signal types.
- The “S” control option means the drive can operate in the following control modes: step (pulse) & direction, velocity (oscillator), streaming serial commands (SCL), and operation with an Applied Motion 4-axis or 8-axis SiNet Hub.
- The “Q” control option means the drive can operate in all of the same control modes as the S option, plus the ability to run a Q program stored in non-volatile memory. Q programs are created using Applied Motion’s *Q Programmer™* software, which provides powerful commands for motion, I/O, conditional processing, multi-tasking, math functions, and more.
- The “IP” control option means the drive comes with EtherNet/IP network communications, the widely used industrial protocol for manufacturing automation applications. With EtherNet/IP users can control, configure and query drives using an open, standards-based, industrial Ethernet connection at speeds up to 100 MBits/sec. These drives run all of the same control modes as “Q” drives, with the addition that all drive features can be accessed over EtherNet/IP. This includes access to more than 100 commands and 130 data registers, which can be used for controlling motion & I/O, configuration, polling, math, register manipulation, and more.
- The “C” control option means the drive is designed to operate on a CANopen communication network and conforms to Can in Automation (CiA) DS301 and DSP402 specifications. C drives support Profile Position, Profile Velocity, and Homing modes, as well as the ability to run stored Q programs via Applied Motion-specific CANopen objects.

STM23 integrated steppers with the S, Q, IP or C control option are setup and configured using Applied Motion’s *ST Configurator™* software. The R control option requires no software for setup; these units are set up using on-board dip switches.

Encoder Option:

Optional 1000-line (4000 count/rev) incremental encoders are available for STM23 steppers.

On units with the S, Q, IP or C control option the encoder is housed inside the same enclosure as the drive electronics, providing protection from dust and debris. The addition of the encoder means the stepper can perform special functions not available otherwise. Stall Detection notifies the system as soon as the required torque is too great for the motor, which results in a loss of synchronization between the rotor and stator, also known as stalling. Stall Prevention actually prevents stalling of the step motor by dynamically adjusting motor speed to maintain synchronization of the rotor to the stator under all conditions. This unique feature allows step motors to operate in a much broader range of applications than previously available to step motors, such as torque-control applications. The Stall Prevention feature also performs static position maintenance, which maintains the position of the motor shaft when at rest.

The optional encoder available for units with the R control option is mounted externally to the drive enclosure, and the functionality available to the user is defined solely by the external controller used.

Inputs/Outputs:

All STM23 integrated steppers come with 3 digital inputs that accept signals of 5-24 VDC. On S, Q, IP and C versions these inputs can be used for connecting pulse & direction signals, end-of-travel limit switches, jog switches, quadrature encoder signals, PLC outputs, sensors, or many other signal types. On R versions the first two inputs are used for the step pulse signals and the third input is used to enable/disable motor power.

All STM23 steppers come with 1 digital output. On S, Q, IP and C versions this output can be defined as a fault output, a motion output, or as a general purpose output, and can be connected to PLC inputs, counters, lights, relays, or other devices. On R versions this output is used to signal a drive or motor fault.

Units with the S, Q and IP control options also come with 1 analog input (not available on C and R versions). This analog input accepts 0-5 VDC and can be used for velocity and position control.

Communication Ports:

STM23 integrated steppers with the S and Q control options are available with either Ethernet, RS-232 or RS-485 ports for programming and serial communications. Units with the IP control option come with an Ethernet port for programming, UDP/TCP serial communications and EtherNet/IP networking. Units with the C control option come with an RS-232 port for programming and a CANopen port for network communications. Units with the R control option do not have any communication ports.

Products in the Series *STM23 Integrated Steppers*

Part Number	Frame Size	Supply Voltage	Control Modes	Holding Torque	Communication Ports	Encoder Feedback	1pc.
STM23C-3CE	NEMA 23	12-70 VDC	CANopen	210	RS-232, CANopen	Yes	\$642.00
STM23C-3CN	NEMA 23	12-70 VDC	CANopen	210	RS-232, CANopen	No	\$552.00
STM23IP-2EE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	125	Ethernet, EtherNet/IP	Yes	\$630.00
STM23IP-2EN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	125	Ethernet, EtherNet/IP	No	\$540.00
STM23IP-3EE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	210	Ethernet, EtherNet/IP	Yes	\$642.00
STM23IP-3EN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	210	Ethernet, EtherNet/IP	No	\$552.00
STM23Q-2AE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	125	RS-232	Yes	\$528.00
STM23Q-2AN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	125	RS-232	No	\$438.00
STM23Q-2EE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	125	Ethernet	Yes	\$542.00
STM23Q-2EN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	125	Ethernet	No	\$452.00
STM23Q-2RE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	125	RS-485	Yes	\$536.00
STM23Q-2RN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	125	RS-485	No	\$446.00
STM23Q-3AE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	210	RS-232	Yes	\$547.00
STM23Q-3AN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	210	RS-232	No	\$457.00
STM23Q-3EE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	210	Ethernet	Yes	\$562.00
STM23Q-3EN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	210	Ethernet	No	\$472.00
STM23Q-3RE	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	210	RS-485	Yes	\$556.00
STM23Q-3RN	NEMA 23	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	210	RS-485	No	\$466.00
STM23R-2ND	NEMA 23	12-70 VDC	Step & Direction	125	NA	No	\$179.00
STM23R-2NE	NEMA 23	12-70 VDC	Step & Direction	125	NA	Yes	\$268.00
STM23R-2NN	NEMA 23	12-70 VDC	Step & Direction	125	NA	No	\$179.00
STM23R-3ND	NEMA 23	12-70 VDC	Step & Direction	210	NA	No	\$190.00

STM23R-3NE	NEMA 23	12-70 VDC	Step & Direction	210	NA	Yes	\$272.00
STM23R-3NN	NEMA 23	12-70 VDC	Step & Direction	210	NA	No	\$190.00
STM23S-2AE	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	125	RS-232	Yes	\$420.00
STM23S-2AN	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	125	RS-232	No	\$330.00
STM23S-2EE	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	Ethernet	Yes	\$434.00
STM23S-2EN	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	Ethernet	No	\$344.00
STM23S-2RE	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	RS-485	Yes	\$428.00
STM23S-2RN	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	125	RS-485	No	\$338.00
STM23S-3AE	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	210	RS-232	Yes	\$439.00
STM23S-3AN	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	210	RS-232	No	\$349.00
STM23S-3EE	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	Ethernet	Yes	\$454.00
STM23S-3EN	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	Ethernet	No	\$364.00
STM23S-3RE	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	RS-485	Yes	\$448.00
STM23S-3RN	NEMA 23	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	210	RS-485	No	\$358.00
STM24IP-3EE	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	340	Ethernet, EtherNet/IP	Yes	\$751.00
STM24IP-3EN	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	340	Ethernet, EtherNet/IP	No	\$661.00
STM24Q-3EE	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	340	Ethernet	Yes	\$691.00
STM24Q-3EN	NEMA 24	12-70 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	340	Ethernet	No	\$601.00
STM24S-3EE	NEMA 24	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	340	Ethernet	Yes	\$583.00
STM24S-3EN	NEMA 24	12-70 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands	340	Ethernet	No	\$493.00