

MSSTAC5

Hardware Manual

- MSSTAC5-S-AN-2V
- MSSTAC5-S-AE-2V
- MSSTAC5-Q-AN-2V
- MSSTAC5-Q-AE-2V
- MSSTAC5-S-RN-2V
- MSSTAC5-S-RE-2V
- MSSTAC5-Q-RN-2V
- MSSTAC5-Q-RE-2V



Rev. 1.0

AMP & MOONS' Automation

Contents

Introduction	3
Features	3
List of MSSTAC5 Model Numbers	3
Block Diagram	4
Getting Started	5
Installing Software	5
Connecting to the PC using RS-232	6
Connecting to a host using RS-485 option card.....	6
Four-Wire Configuration.....	7
Two-Wire Configuration.....	7
RS485 Addressing & LED Display	8
Baud Rate	10
Connecting AC Power	11
Fusing	11
Line Filter	11
Connecting the Motor	12
Connecting an Encoder (Requires the Encoder Feedback option).....	13
IO Functions	14
Connecting Input Signals	15
Connector Pin Diagrams	15
High Speed Digital Inputs	15
Lower Speed, Differential Digital Inputs	17
Single Ended Digital Inputs	18
What is COM?.....	18
Analog Input.....	19
Programmable Outputs	20
Recommended Motors	22
Torque-Speed Curves	22
Mounting the Drive	23
Mechanical Outline.....	23
Technical Specifications	24
Mating Connectors and Accessories.....	25
Alarm Codes	26
Contacting MOONS'	27

Introduction

Thank you for selecting a MOONS' motor control product. We hope our dedication to performance, quality and economy will make your motion control successful.

If there's anything we can do to improve our products or help you use them better, please call or fax. We'd like to hear from you. Our phone number is +86-21-52634688, or you can reach us by fax at (021) 62968682. You can also email to info@moons.com.cn

Features

- Programmable, microstepping digital step motor driver in compact package
- MSSTAC5-2V models operate from 94- 265VAC
- Operates in velocity or position mode
- Accepts analog signals, digital signals
- Accept incremental encoder feedback signal. Single-ended or Differential. (Optional)
- MSSTAC5-2V provides motor current up to 2.55 amps/phase (peak of sine)
- Communications:
 - RS-232 or RS-485
- Digital I/O
 - RS232: four optically isolated digital inputs, two optically isolated digital outputs
twelve optically isolated digital inputs, six optically isolated digital outputs(for -Q-A version)
 - RS485: four optically isolated digital inputs, two optically isolated digital outputs
- ± 10 volt analog input for speed and position control. Can also be configured for 0 to 10V, $\pm 5V$ or 0 to 5V signal ranges.

List of MSSTAC5 Model Numbers

Model	Control	Current	Voltage	Encoder	RS-232	RS-485	Expand I/O	
MSSTAC5-S-AN-2V	S	0.5-2.55A	94-265VAC		√			
MSSTAC5-S-AE-2V				√	√			
MSSTAC5-S-RN-2V					√	√		
MSSTAC5-S-RE-2V				√	√	√		
MSSTAC5-Q-AN-2V	Q						√	√
MSSTAC5-Q-AE-2V				√	√		√	√
MSSTAC5-Q-RN-2V					√	√		
MSSTAC5-Q-RE-2V				√	√	√		

An "A" in the model number indicates the RS232 communication is supported.

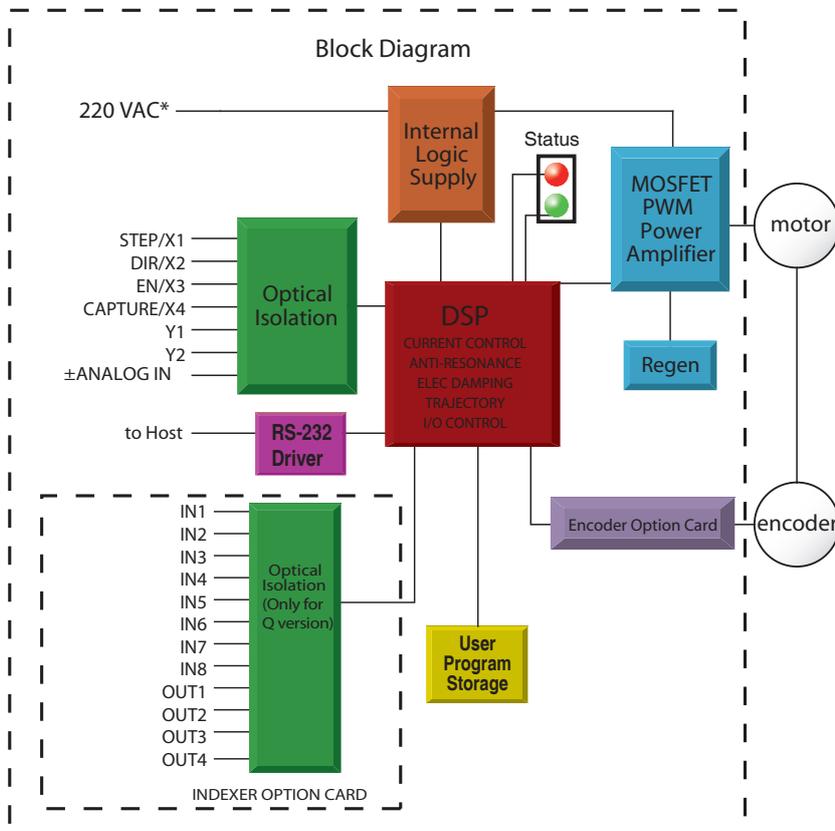
An "R" in the model number indicates the RS485 communication is supported.

An "E" in the model number indicates the inclusion of the models operate Encoder Feedback connector.

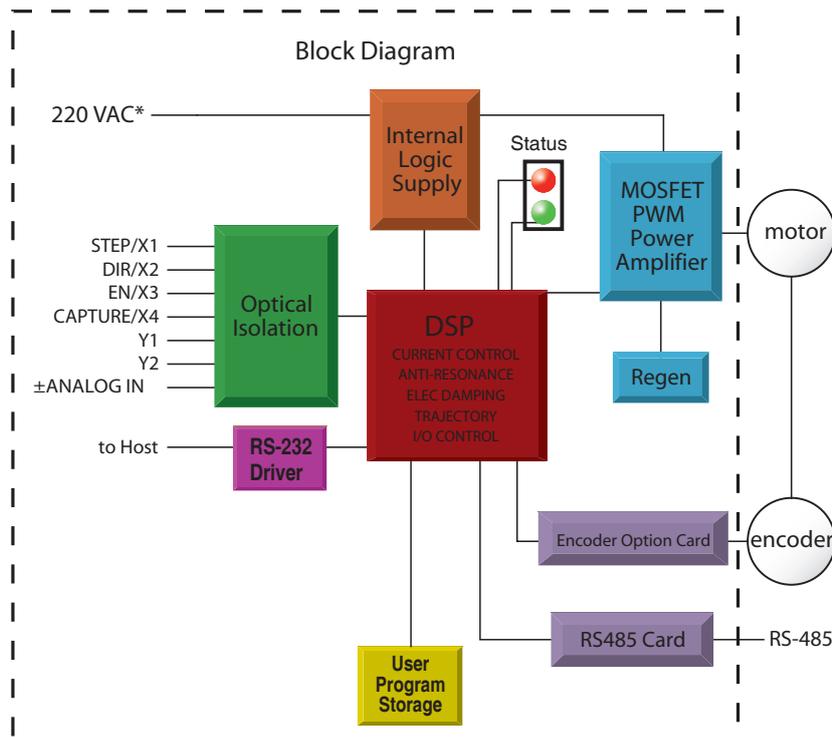
An "N" in the model number indicates no encoder feedback connector on the drive.

Block Diagram

MSSTAC5 RS232 Step Motor Drive



MSSTAC5 RS485 Step Motor Drive



Getting Started

This manual describes the use of all different drive models. What you need to know and what you must have depends on the drive model. For all models, you'll need the following:

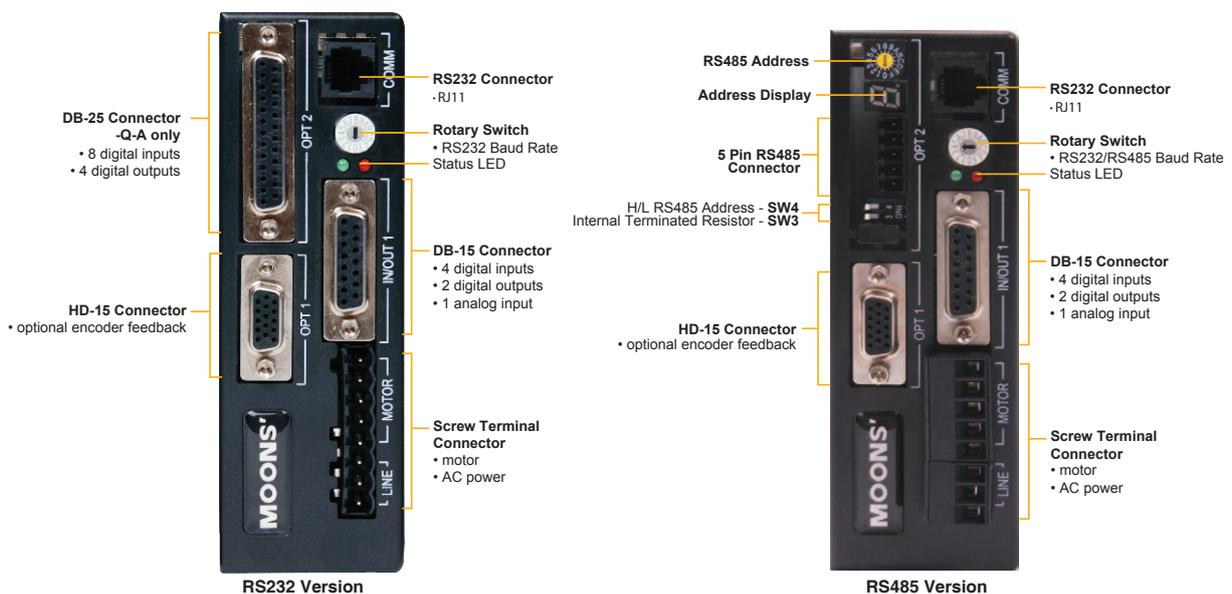
- 94-265V AC power
- a compatible step motor
- a small flat blade screwdriver for tightening the connectors (included).
- a personal computer running Microsoft Windows XP or Windows 7
- a MOONS' programming cable (included with all Models; RS-422/485 converters are available from MOONS')

Installing Software

If you've never used a MSSTAC5 drive before you'll need to get familiar with the drive and the set up software before you try to deploy the system in your application. We strongly recommend the following:

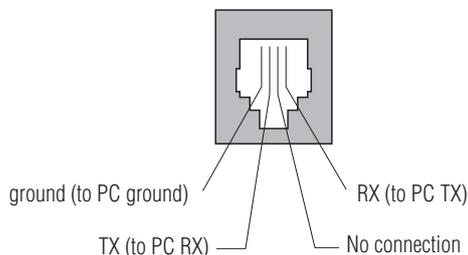
1. For -S drives, download and install the **ST Configurator** software
For -Q drives, download and install the **ST Configurator** and **Q Programmer**
2. Launch the software by clicking Start...Programs...MOONS'...**ST Configurator**.
3. Connect the drive to the PC using the programming cable. When using RS-422/485, it must be set up in a 4-Wire configuration (see "Connecting to a host using RS-422/485" below)
4. Connect the drive to the motor (see Connecting the Motor).
5. Connect the drive to the AC power (see Connecting AC Power).
6. Apply power to the drive.
7. The software will recognize the drive and display the model and firmware version. At this point, it is ready for use.

The connectors and other points of interest are illustrated below. Depending on your drive model and application, you'll need to make connections to various parts of the drive. These are detailed later in the manual.



Connecting to the PC using RS-232

Locate the MSSTAC5 S/Q within 2.5 meters of the PC. Plug the DB9 connector of the programming cable that came with the drive into the serial port of the PC. Plug the small end into the PC on the MSSTAC5 S/Q . Secure the cable to the PC with the screws on the DB9 connector.



Pin Assignments of the PC Port (RJ11 connector)

Never connect a drive to a telephone circuit. It uses the same connectors and cords as telephones and modems, but the voltages are not compatible.

Note: If the PC does not have an RS-232 serial port, a USB Serial Converter will be needed. You can contact MOONS' to buy a USB to RS-232 converter.

The RS-232 circuitry does not have any extra electrical “hardening” and care should be taken when connecting to the RS-232 port as hot plugging could result in circuit failure. If this is a concern the RS-485 version should be used.

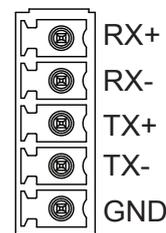
Connecting to a host using RS-485 option card

RS-485 allows you to connect more than one drive to a single host PC, PLC, HMI or other computer. It also allows the communication cable to be long (more than 1000 feet). But the device to which you connect must have an RS-485 port.

Pin diagram is shown on the right. Wiring diagrams can be found on the next page. We recommend the use of Category 5 cable. It is widely used for computer networks, it is inexpensive, easy to get and certified for quality and data integrity.

The MSSTAC5 drives can be used with either two wire or four wire RS-485 implementations. The connection can be point to point (i.e. one drive and one host) or a multi-drop network (one host and up to 32 drives).

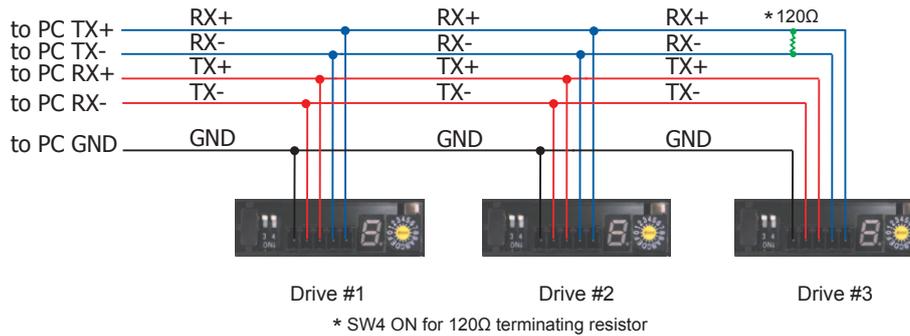
Four wire systems are better than two wire types because the host can send and receive data at the same time, increasing system throughput. Furthermore, the host never needs to disable its transmitter, which simplifies your software.



Four-Wire Configuration

Four-Wire Systems utilize separate transmit and receive wires. One pair of wires must connect the host's transmit signals to each drive's RX+ and RX- terminals. The other pair connects the drive's TX+ and TX- terminals to the host's receive signals. A logic ground terminal is provided on each drive and can be used to keep all drives at the same ground potential. This has been opto-isolated from drive power ground. It is recommended to connect the logic ground to the host computer ground to eliminate common mode noise.

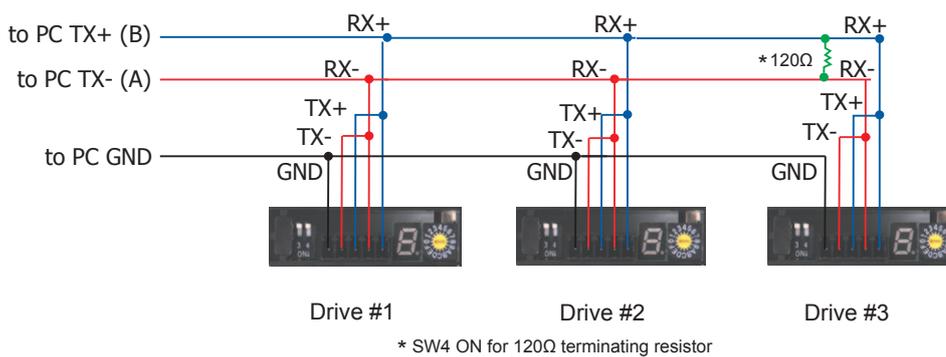
Because the host in a four-wire system never needs to disable its transmitter, software is simplified. Some converters make this process very difficult to implement and can delay communications.



NOTE: If the PC does not have an RS-485 serial port, a converter is required. You can contact MOONS' to buy a USB to RS-485 converter.

Two-Wire Configuration

In a 2-wire system, the host must disable its transmitter before it can receive data. This must be done quickly before a drive begins to answer a query. The MSSTAC5 includes a transmit delay parameter that can be adjusted to compensate for a host that is slow to disable its transmitter. This adjustment can be made over the network using the TD command, or it can be set using the ST Configurator software. It is not necessary to set the transmit delay in a four wire system.



NOTE: If the PC does not have an RS-485 serial port, a converter is required. You can contact MOONS' to buy a USB to RS-485 converter.

RS485 Addressing & LED Display

RS485 Address (Node ID) are set through 16-position rotary switch and piano switch SW3. The LED display will show relevant address selected.



Note: RS485 address is only set by rotary switch and piano switch on RS485 option board. Software configuration does not support to set RS485 address.

Rotary Switch Position	Piano Switch SW3 setting	LED Display	RS485 Address (in RS485 Bus utility)
0	 OFF	0	0
1	 OFF	1	1
2	 OFF	2	2
3	 OFF	3	3
4	 OFF	4	4
5	 OFF	5	5
6	 OFF	6	6
7	 OFF	7	7
8	 OFF	8	8
9	 OFF	9	9
A	 OFF	A	:
B	 OFF	b	;
C	 OFF	C	<
D	 OFF	d	=
E	 OFF	E	>
F	 OFF	F	?

0		0.	@
1		1.	!
2		2.	“
3		3.	#
4		4.	\$
5		5.	%
6		6.	&
7		7.	‘
8		8.	(
9		9.)
A		A.	*
B		b.	+
C		C.	,
D		d.	-
E		E.	.
F		F.	/

Baud Rate

A 16-position rotary switch, located on the front panel, is used to set the RS232/RS485 bit rate.



Rotary Switch Position	Bit Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
From 5 to F	9600

Note: Bit Rate is only set by rotary switch on front panel, Software configuration does not support to change bit rate setting.

Connecting AC Power

Using the connector supplied connect to the AC supply per the diagram below. Use 16 AWG wire for Line (L) and Neutral (N). Use 14 AWG for Earth Ground (⊕).

Care should always be taken when working with high voltages.

In regions where the single-phase supply is higher, an auto transformer can be used to drop the voltage to the correct level.

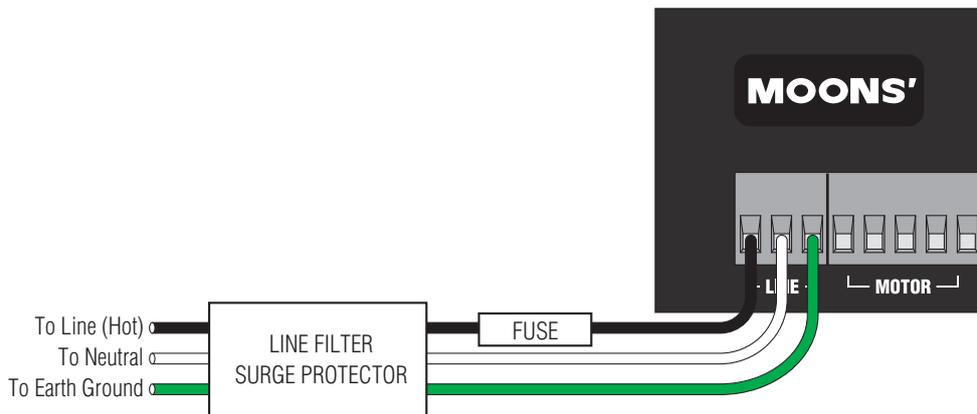
Fusing

The MSSTAC5-2V contains an internal 6.3A fast acting fuse. If an external fuse is desired, we recommend a 3A fast acting fuse for the MSSTAC5 .

Line Filter

For applications requiring CE EMC compliance, a line filter is required in series with the AC input. Here are two choices.

1. Vendor: Tyco Electronics Corcom Part Number: 6ET1
2. Vendor: LCR Electronics, inc. Part Number: 092.00721.00



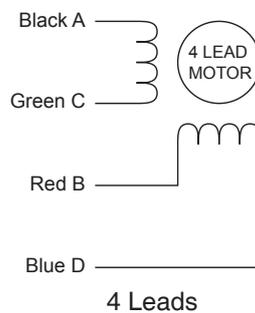
Connecting the Motor

Never connect or disconnect the motor while the power is on.

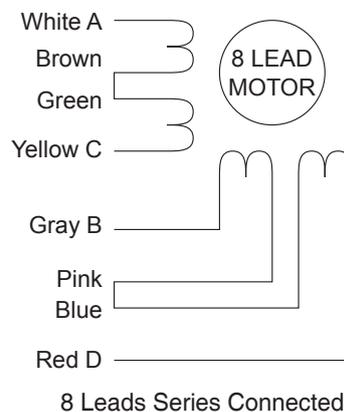
Note: it is highly recommended that you use a motor with a shielded cable with the MSSTAC5. Always connect the cable drain wire to the drive's \ominus terminal (next to the A+ terminal)
The recommended MOONS' motors for the MSSTAC5 include shielded cables. See the Recommended Motors section for a list of part numbers.

We can't stress enough the wisdom in using one of the recommended motors. We're not just trying to make money here, we want your application to be successful and the odds of that are highest when you have a high quality motor whose torque, rotor inertia and harmonic waveform content are precisely known. If you do want to connect other motors , here is some information that will help you.

Four lead motors can only be connected one way. Please follow the sketch at the below.



Eight leads motors can also be connected in series. As with eight leads motor, series operation gives you less torque at high speeds, but may result in lower motor losses and less heating. Parallel operation is not recommend for 220VAC power.



Eight leads motors can also be connected in parallel. As with eight leads motor, parallel operation gives you much more torque at high speeds, but may also result in much more heat generated that can cause danger to both motor and drive. You should contact us for more technical details of using parallel operation, make sure it will be safe in your application.

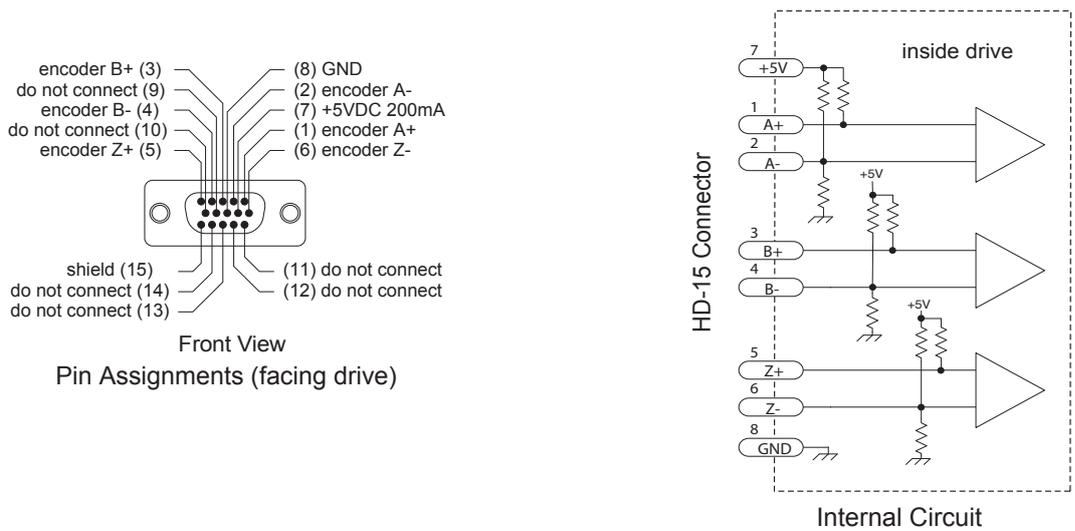
Connecting an Encoder (Requires the Encoder Feedback option)

The motors recommended for use with MSSTAC5 drives are available with rear-shaft mounted encoders.

Note: remember to always order a double-shaft motor if you need an encoder option. The mating cables available for these encoders come with an HD-15 connector on one end that connects directly to the optional encoder connector on the MSSTAC5, and a mating connector on the other end that connects directly to the encoder. Simply connect the cable between the encoder and the drive and you're done. For applications where you might use your own encoder, you'll need to connect to the MSSTAC5 drive's encoder connector using the pin assignments below.

If you are using an encoder with single ended outputs, shame on you. Differential connections are far less sensitive to electrical interference and life is too short to waste time deciphering the bizarre problems that can occur with a poor quality encoder. That said, single ended encoders should be connected to the A+ and B+ terminals. Leave A- and B- unconnected. They are internally biased to the proper voltage for best results. You'll also need to select the "single ended" box in the encoder button of ST Configurato or the drive will think you have a broken encoder wire. That's another good reason to use a differential encoder, the MSSTAC5 can detect a broken wire or bad signal and alert you to the problem.

The encoder connections use a HD-15 connector, which you must connect to your encoder as shown below.



IO Functions

Basic I/O details

Standard IN/OUT1 Connector						
	X1	X2	X3	X4	Y1	Y2
Voltage range	5 - 24V	5 - 24V	5 - 24V	5 - 24V	30V max	30V max
Speed range	2 MHz	2 MHz	2 MHz	2 MHz	5KHz	5KHz
Digital filter option	Yes	Yes	Yes	Yes	N/A	N/A

Additional I/O details

Expand IN/OUT2 Connector(OPT2)												
	IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8	OUT1	OUT2	OUT3	OUT4
Voltage range	5-24V	5-24V	12-24V	12-24V	12-24V	12-24V	5-24V	5-24V	30Vmax	30Vmax	30Vmax	30Vmax
Speed range	5KHz	5KHz	5KHz	5KHz	5KHz	5KHz	5KHz	5KHz	5KHz	5KHz	5KHz	5KHz
Digital filter option	Yes	Yes	No	No	No	No	Yes	Yes	N/A	N/A	N/A	N/A

Notes:

I/O functions are configured using ST Configurator software and/or SCL commands.

Connecting Input Signals

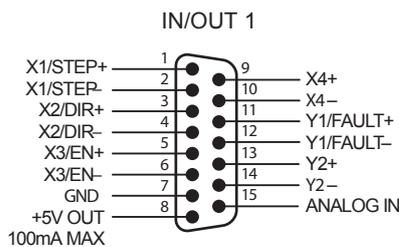
The MSSTAC5 drives have four types of inputs.

- High speed digital inputs for step & direction commands or encoder following, 5-24 volt logic. These inputs, X1/STEP and X2/DIR are available on all models. They can also be used to connect sensors and other types of devices. The connection can be sourcing, sinking or differential.

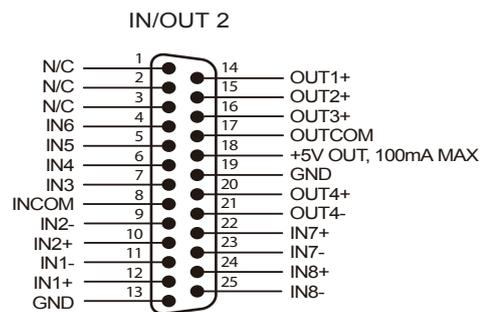
High speed digital inputs for enable motor or alarm reset or high speed capture, 5-24 volt logic. These inputs, X3/EN/AR and X4/Capture are available on all models. They can also be used to connect sensors and other types of devices. The connection can be sourcing, sinking or differential.

- Lower speed digital inputs for other signals, 5 - 24 volt logic, -Q-A drive only. The model include four differential inputs, IN1, IN2, IN7 and IN8.
- 12-24V lower speed single ended inputs which accept sourcing or sinking inputs. These four inputs, IN3-IN6 are only present on on -Q-A models.
- Analog input for analog speed and positioning modes, included on all drives. Can be configured for 0-10V, 0-5V, $\pm 10V$ or $\pm 5V$, with or without offset.

Connector Pin Diagrams



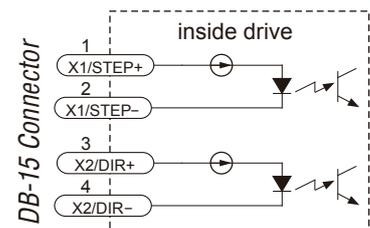
This connector is included on all models.



This connector is standard on -Q-A models.

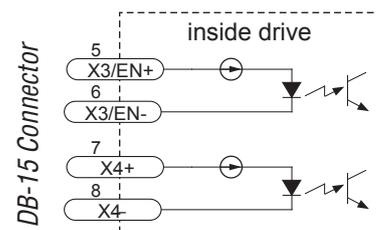
High Speed Digital Inputs

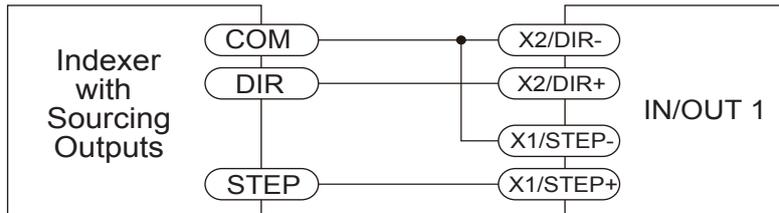
All MSSTAC5 drives include two high speed inputs called X1/STEP and X2/DIR. They accept 5-24 volt single-ended or differential signals, up to 2 MHz. Normally these inputs connect to an external controller that provides step & direction command signals. You can also connect a master encoder to the high speed inputs for encoder following applications. Or you can use these inputs with Wait Input, If Input, Feed to Sensor, Seek Home and other such commands.



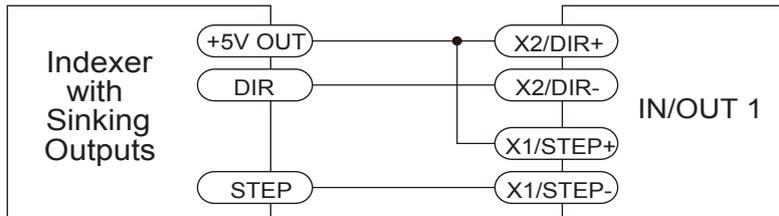
All MSSTAC5 drives include two high speed inputs called X3/EN/AR and X4/Capture. They accept 5-24 volt single-ended or differential signals, You can use these inputs with Wait Input, If Input, Feed to Sensor, Seek Home and other such commands.

Connection diagrams follow.

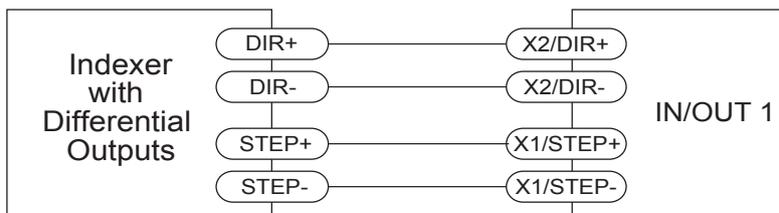




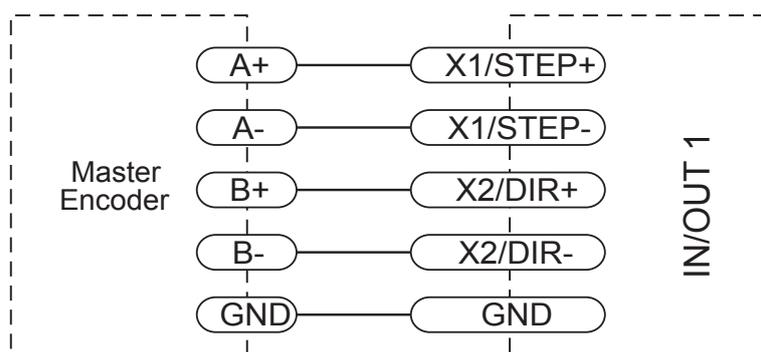
Connecting to indexer with Sourcing Outputs



Connecting to Indexer with Sinking Outputs



Connecting to Indexer with Differential Outputs
(Many high speed indexers have differential outputs)



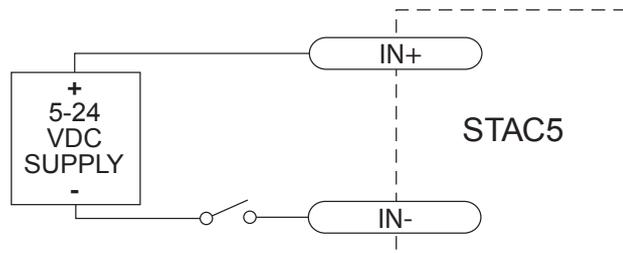
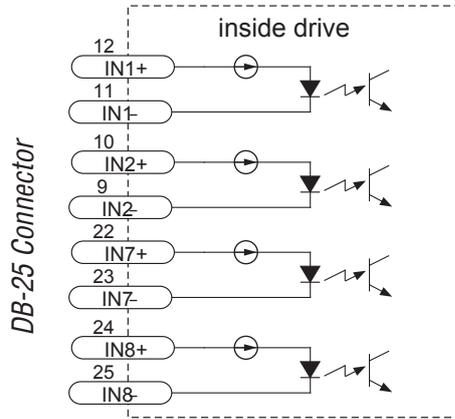
Wiring for Encoder Following

(Encoder power can be supplied from the +5V OUT terminal on IN/OUT 1 if the encoder requires no more than 100mA)

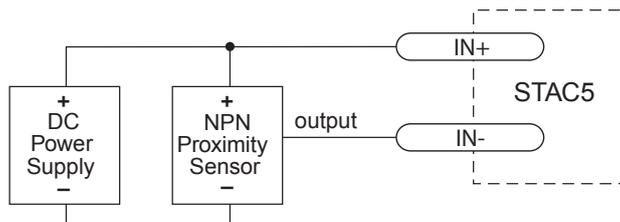
Lower Speed, Differential Digital Inputs

-Q-A models include four additional differential inputs on the IN/OUT2 (OPT2) connector called IN1, IN2, IN7 and IN8. IN1 and IN2 can be used for connection to sensors and other devices. IN7 and IN8 are normally used for end of travel limit switches, but can be used for registration sensors, etc.

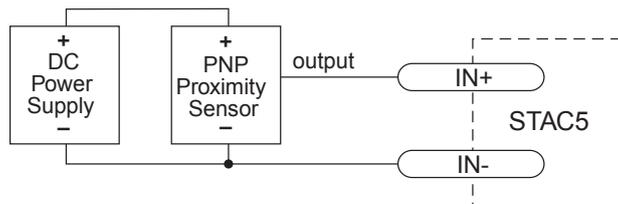
Connection diagrams follow.



Connecting a Mechanical Switch to Low Speed Differential Inputs



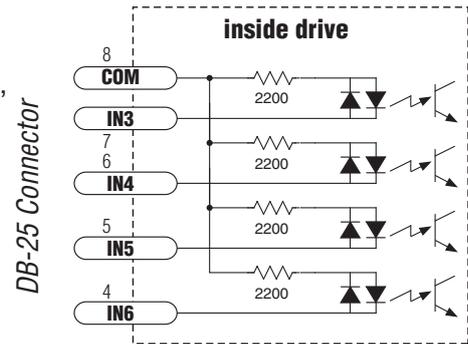
Connecting an NPN Proximity Sensor to Low Speed Differential Inputs



Connecting a PNP Proximity Sensor to Low Speed Differential Inputs

Single Ended Digital Inputs

The -Q-A drives include four single ended, optically isolated input circuits that can be used with sourcing or sinking signals, 12 to 24 volts. This allows connection to PLCs, sensors, relays and mechanical switches. Because the input circuits are isolated, they require a source of power. If you are connecting to a PLC, you should be able to get power from the PLC power supply. If you are using relays or mechanical switches, you will need a 12-24 V power supply.

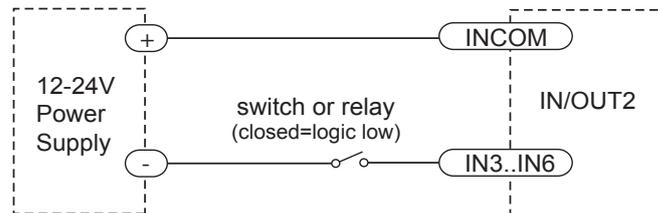


What is COM?

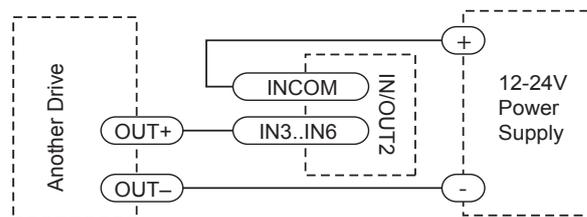
“Common” is an electronics term for an electrical connection to a common voltage. Sometimes “common” means the same thing as “ground”, but not always. In the case of the MSSTAC5 drives, if you are using sourcing (PNP) input signals, then you will want to connect COM to ground (power supply -). If you are using sinking (NPN) signals, then COM must connect to power supply +.

Note: If current is flowing into or out of an input, the logic state of that input is low or closed. If no current is flowing, or the input is not connected, the logic state is high or open.

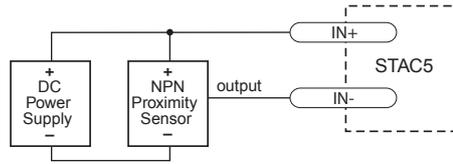
The diagrams on the following pages show how to connect the inputs to various commonly used devices.



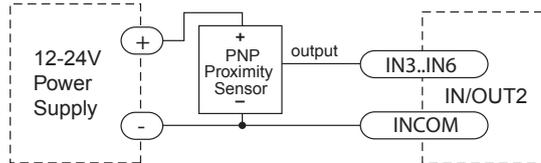
Connecting an Input to a Switch or Relay



Connecting another drive to the STAC5
(When output closes, input goes low).



Connecting an NPN Proximity Sensor to Low Speed Differential Inputs

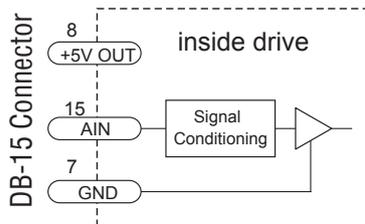


Connecting a PNP Type Proximity Sensor to a an input
(When prox sensor activates, input goes low).

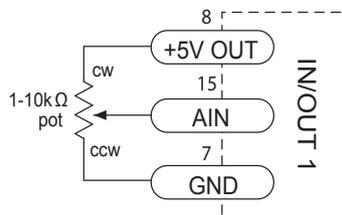
Analog Input

The MSSTAC5 drives feature one analog input. It can accept a signal range of 0 to 5 VDC, ± 5 VDC, 0 to 10 VDC or ± 10 VDC. The drive can be configured to operate at a speed or position that is proportional to the analog signal.

Use the ST Configurator software to set the signal range, offset, deadband and filter frequency.



Connecting a Potentiometer to the Analog Input



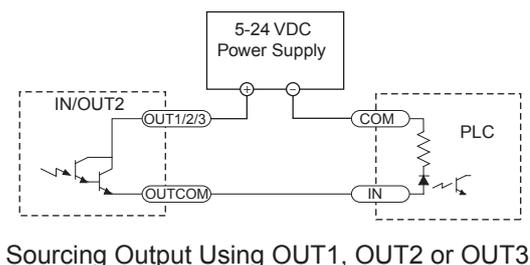
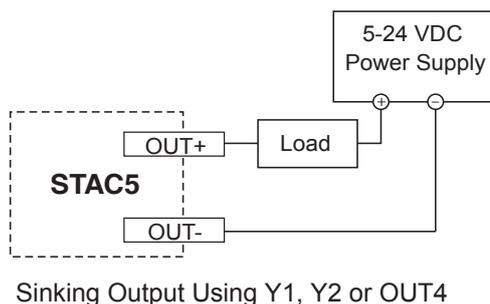
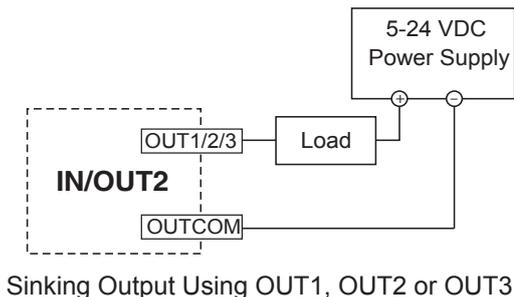
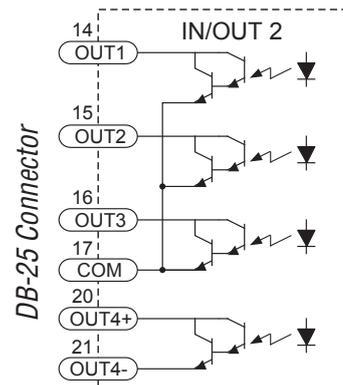
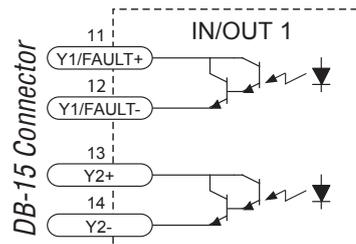
Programmable Outputs

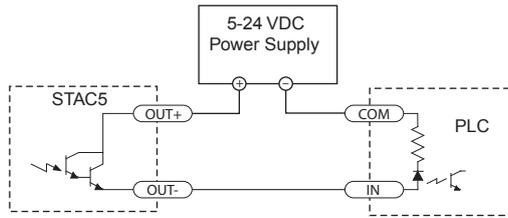
The MSSTAC5-S drives feature two digital outputs. These outputs can be set to automatically control a motor brake, to signal a fault condition, to indicate when the motor is moving or to provide an output frequency proportional to motor speed (tach out). Or the outputs can be turned on and off by program instructions like Set Output. MSSTAC5-Q-A drives include four additional programmable outputs.

The outputs can be used to drive LEDs, relays and the inputs of other electronic devices like PLCs and counters. For Y1, Y2 and OUT4, the “+” (collector) and “-” (emitter) terminals of each transistor are available at the connector. This allows you to configure each output for current sourcing or sinking. OUT1, OUT2 and OUT3 can only sink current. The COM terminal must be tied to power supply (-).

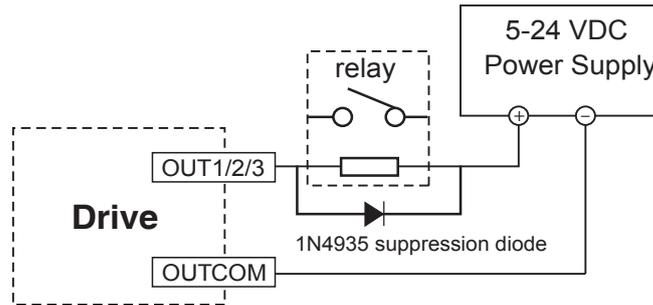
Diagrams of each type of connection follow.

Do not connect the outputs to more than 30VDC.
The current through each output terminal must not exceed 100 mA.

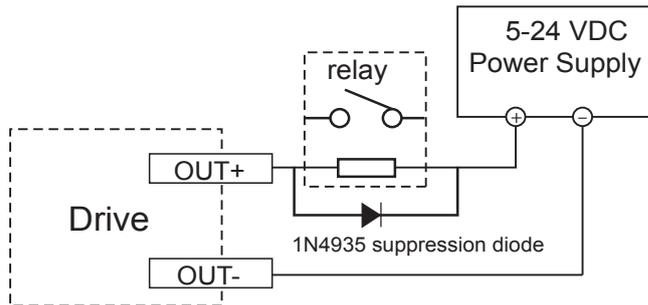




Sourcing Output Using Y1, Y2 or OUT4



Driving a Relay Using OUT1,OUT2 or OUT3



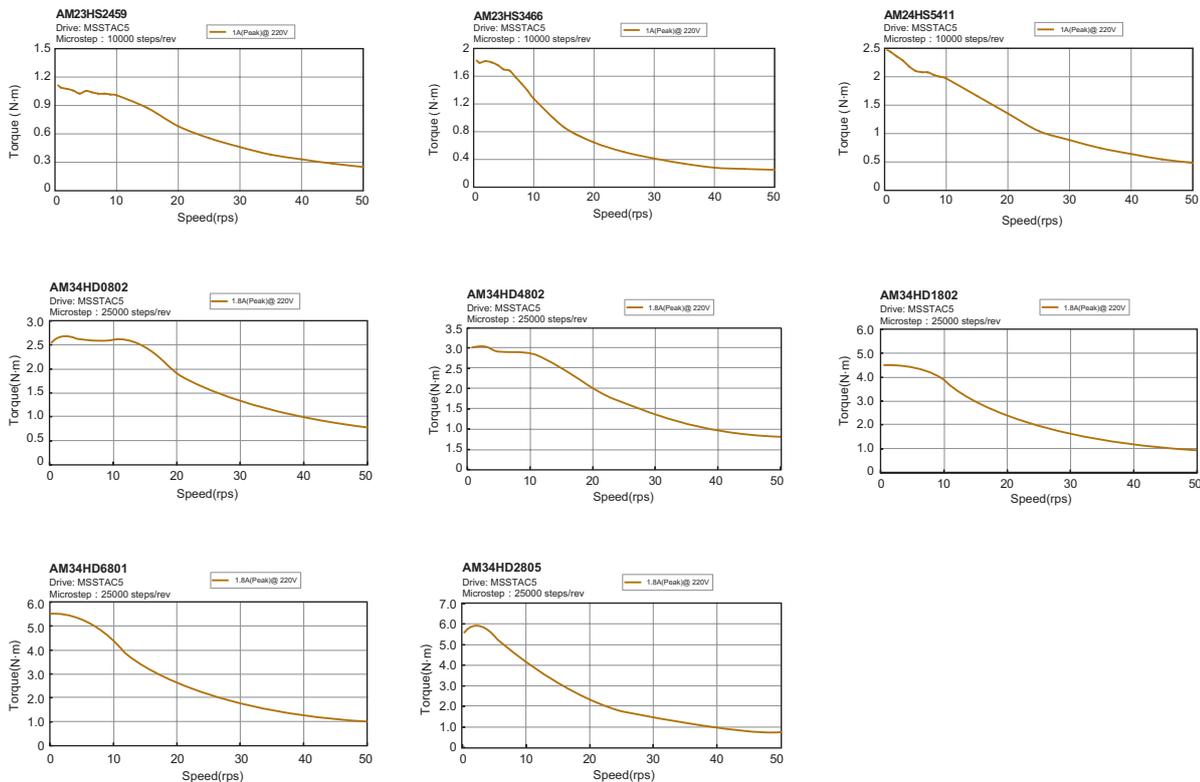
Driving a Relay Using Y1, Y2, or OUT4

Recommended Motors

Model	Shaft	Wiring	Length "L"	Holding Torque	Current	Resistance	Rotor Inertia	Motor Mass	Dielectric Strength
			mm	N·m	A/Phase	Ω/Phase	g·cm ²	Kg	
AM23HS2459-01	Single Shaft	4 Leads	54	1.1	1	16.6	260	0.6	1500V AC 1 minute
AM23HS3466-01			76	1.8		25.4	460	1.0	
AM24HS5411-01N	Single Shaft		85	2.5		15.4	900	1.4	
AM34HD0802-01	Single Shaft	8 Leads Series Connected	66.5	3	1.8	3.4	1100	1.6	
AM34HD0802-02	Double Shaft		75	3.5		3.6	1350	1.9	
AM34HD4802-01	Single Shaft		96	5		3.6	1850	2.7	
AM34HD1802-01	Single Shaft		115	6.5		4	2400	3.5	
AM34HD1802-03	Double Shaft								
AM34HD6801-01	Single Shaft		125.5	7.1		4.2	2750	3.8	
AM34HD2805-01	Single Shaft								
AM34HD2805-03	Double Shaft								

Note: The “Drive Current Setting” shown here differs from the rated current of each motor because the rated current is RMS and the drive current setting is peak sine. If you are using a motor not listed here, for best results set the drive current at the motor’s rated current x 1.2.

Torque-Speed Curves

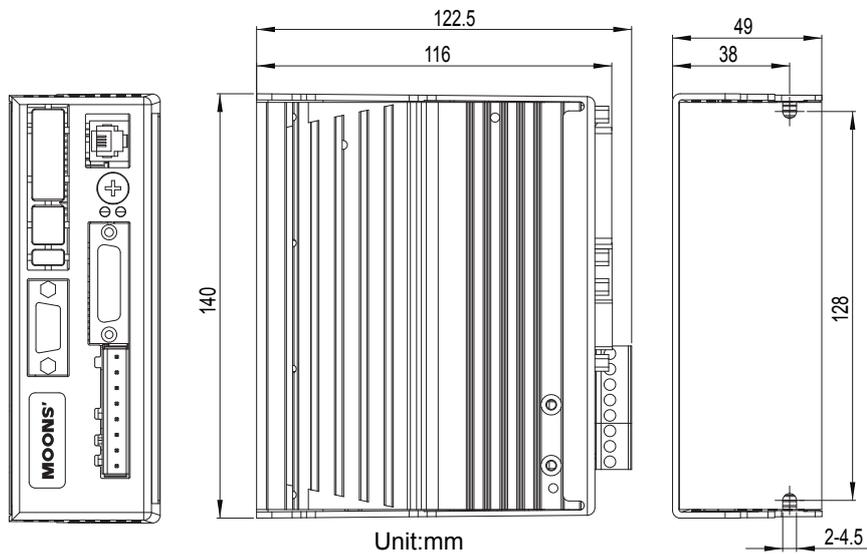


Mounting the Drive

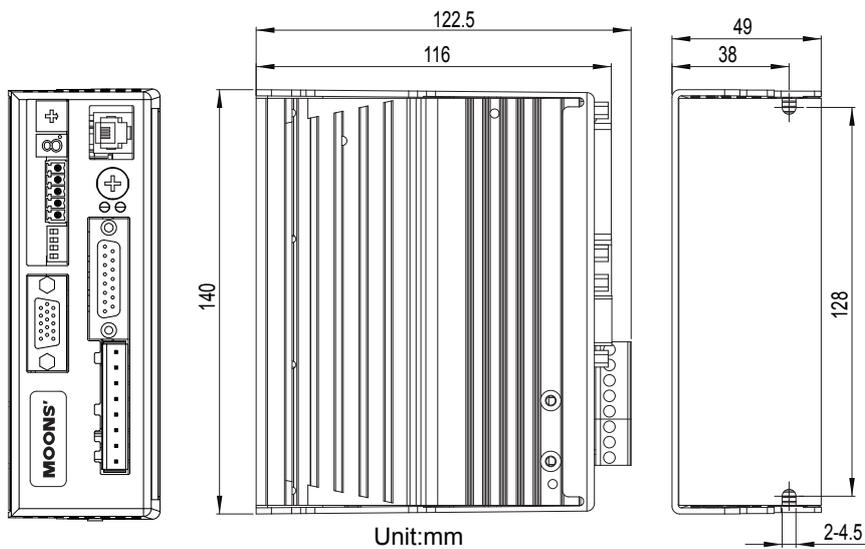
Use M4 screws to mount your drive. If possible, the drive should be securely fastened to a smooth, flat metal surface that will help conduct heat away from the chassis. If this is not possible, then forced airflow from a fan may be required to prevent the drive from overheating.

- Never use your drive in a space where there is no air flow or where other devices cause the surrounding air to be more than 40°C.
- Never put the drive where it can get wet or where metal or other electrically conductive particles can get on the circuitry.
- Always provide air flow around the drive. When mounting multiple MSSTAC5 drives near each other, maintain at least one half inch of space between drives.

Mechanical Outline



RS-232 Version



RS-485 Version

Technical Specifications

AMPLIFIER TYPE	Digital MOSFET, dual H-bridge, 4 quadrant
CURRENT CONTROL	4 state PWM at 16 KHz
OUTPUT CURRENT	MSSTAC5-2V: 0.5-2.55 amps/phase (peak of sine) in 0.01 amp increments
POWER SUPPLY	MSSTAC5-2V: 94-265 VAC, 50/60Hz
PROTECTION	Over-voltage, under-voltage, over-temp, motor/wiring shorts (phase-to-phase, phase-to-ground), internal amplifier shorts
MOTOR REGENERATION	Built-in regeneration circuit, 10 watts max.
IDLE CURRENT REDUCTION	Reduction range of 0-90% of running current after delay selectable in milliseconds
MICROSTEP RESOLUTION	Software selectable from 200 to 51200 steps/rev in increments of 2 steps/rev
MICROSTEP EMULATION	Performs high resolution stepping by synthesizing fine microsteps from coarse steps. Reduces jerk and extraneous system resonances. (Step & direction mode only).
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 of 0.25 to 1.5 rps.
ENCODER INTERFACE	For connecting to motor-mounted encoder. Used to provide stall detection and stall prevention with static position maintenance. Differential line receivers, up to 2 MHz.
INPUTS/OUTPUTS: S and Q models	X1, X2 inputs: Optically isolated, differential, 5-24 VDC logic (2.5V switching threshold), minimum pulse width = 250 nsec, maximum pulse frequency = 2 MHz, 2 usec minimum set up time for direction signal, maximum current = 10 mA. X3, X4 inputs: Optically isolated, differential, 5-24 VDC logic (2.5V switching threshold), minimum pulse width = 250 nsec, maximum pulse frequency = 2 MHz, maximum current = 10 mA. Y1, Y2 outputs: Optical darlington, sinking or sourcing, 30 VDC max, 100 mA max, voltage drop = 1.2V max at 100 mA. Analog input: Single-ended. Range is software selectable 0-5, +/-5, 0-10, or +/-10 VDC. Software configurable offset, deadband, and filtering. Resolution is 12 bits (+/- 10 volt range), 11 bits (+/-5 or 0-10 volt range), or 10 bits (0-5 volt range). 100 kohms internal impedance.

INPUTS/OUTPUTS: -Q-A models only	-Q-A models have the same I/O as above plus the following: IN1, IN2, IN7, IN8 inputs: Optically isolated, differential, 5-24 VDC logic (2.5V switching threshold), 100 usec minimum pulse width, maximum current = 10 mA. IN3-IN6 inputs: Optically isolated, single-ended, shared common. sinking or sourcing, 12-24 VDC logic, 2200 ohms, maximum current = 10 mA. OUT1-OUT3 outputs: Optical darlington, single-ended, shared, sinking, 30 VDC max, 100 mA max, voltage drop = 1.2V max at 100 mA. OUT4 output: Optical darlington, sinking or sourcing, 30 VDC max, 100 mA max, voltage drop = 1.2V max at 100 mA.
NON-VOLATILE STORAGE	Drive configuration and Q program are stored in FLASH memory onboard the DSP.
AGENCY APPROVALS	“RoHS CE EN61800-3:2004 UL 508c”
HUMIDITY	90% max, non-condensing
AMBIENT TEMPERATURE	0 to 40 °C (32 to 104 °F) with adequate ventilation
DIMENSIONS	122.5×128×49mm
WEIGHT	22.4 oz (630 g)

Mating Connectors and Accessories

Mating Connectors

Power supply: Weidmuller P/N 1526510000

Motor: Weidmuller P/N 1526710000

IN/OUT1: DB-15 male. OUPIIN P/N 7907-15MTBC00A. Shell Kit OUPIIN P/N DP-15CP. Included.

IN/OUT2: DB-25 male. OUPIIN P/N 7907-25MTBC00A. Shell Kit OUPIIN P/N DP-25CP. Included.

Optional encoder feedback: DB-15 male. OUPIIN P/N 7917-15MTBC00A. Shell Kit OUPIIN P/N DP-09CP. Included.

RS485 card: Weidmuller P/N 1792800000

Alarm Codes

In the event of an error, the green LED on the main board will flash one or two times, followed by a series of red flashes. The pattern repeats until the alarm is cleared.

	Code	Error
	Solid green	no alarm,motor disabled
	Flashing green	no alarm,motor enabled
	1 red,1 green	motor stall (optional encoder only)
	2 red,1 green	ccw limit
	2 red,2 green	cw limit
	3 red,1 green	drive overheating
	3 red,2 green	internal voltage out of range
	3 red,3 green	blank Q segment
	4 red,1 green	power supply overvoltage or excess regen
	4 red,2 green	power supply undervoltage
	4 red,3 green	flash memory backup error
	5 red,1 green	Over current/short circuit
	6 red,1 green	Open motor winding
	6 red,2 green	bad encoder signal (optional encoder only)
	7 red,1 green	communication error
	7 red,2 green	flash memory error

Contacting MOONS'



- **Headquarters**
No. 168 Mingjia Road Industrial Park North Minhang District Shanghai 201107, P.R. China
Tel: +86(0)21-52634688
Fax: +86(0)21-62968682
E-mail: info@moons.com.cn

- **MOONS' Industries (America), Inc.**
1113 North Prospect Avenue,Itasca, IL 60143 U.S.A.
Tel: 001-630-833-5940
Fax: 001-630-833-5946

- **MOONS' Industries (Europe) S.r.l.**
Via Torri Bianche n.1 20059 Vimercate(MB) Italy
Tel: +39 039 62 60 521
Fax: +39 039 96 31 409

- **MOONS' Industries (South-East Asia) Pte Ltd.**
33 Ubi Avenue 3 #08-23 Vertex Singapore 408868
Tel: +65 6634 1198
Fax: +65 6634 1138

- **Shenzhen Branch Office**
Room 2209, 22/F, Kerry Center,No. 2008 Renminnan Road Shenzhen 518001 P. R.China
Tel: +86 (0)755 25472080
Fax: +86 (0)755 25472081

- **Beijing Branch Office**
Room 202, Unit 2, 7th Building,Huilongsen International Science & Technology Industry Park,
No.99, Kechuang 14th Street,Beijing 101111 P. R.China
Tel: +86 (0)10 59755578
Fax: +86 (0)10 59755579

- **Qingdao Branch Office**
Room 10E, No.73 Wangjiao Mansion, mid. Hongkong Road Qingdao 266071 P. R.China
Tel: +86 (0)532 85879625
Fax: +86 (0)532 85879512

- **Wuhan Branch Office**
Room 3001, World Trade Tower, No.686 Jiefang Avenue, Jiangnan District, Wuhan 430022 P.R.China
Tel: +86 (0)27-85448742
Fax: +86 (0)27-85448355

- **Nanjing Branch Office**
Room 302, Building A, Tengfei Creation Center,55 Jiangjun Avenue, Jiangning District,Nanjing 211100 P.
R.China
Tel: +86 (0)25 52785841
Fax: +86 (0)25 52785485

- **Chengdu Branch Office**
Room 1917, Western Tower, No.19,4th Section of South People Road,Wuhou District,Chengdu 610041
P.R.China
Tel: +86 (0)28-85268102
Fax: +86 (0)28-85268103

- **Xi'an Branch Office**
Room 1006, Block D, Wangzuo International City, No.1 Tangyan Road, Xi'an 710065 P.R. China
Tel: +86 (0)29 81870400
Fax: +86 (0)29 81870340