Technical Specifications

5/2/98

Motion   Speed adjustable from 100 to 25,000 steps/second. Acceleration range is 1000 to 255,000 steps/sec/sec. Distance can be 1 to 8,388,608 steps.
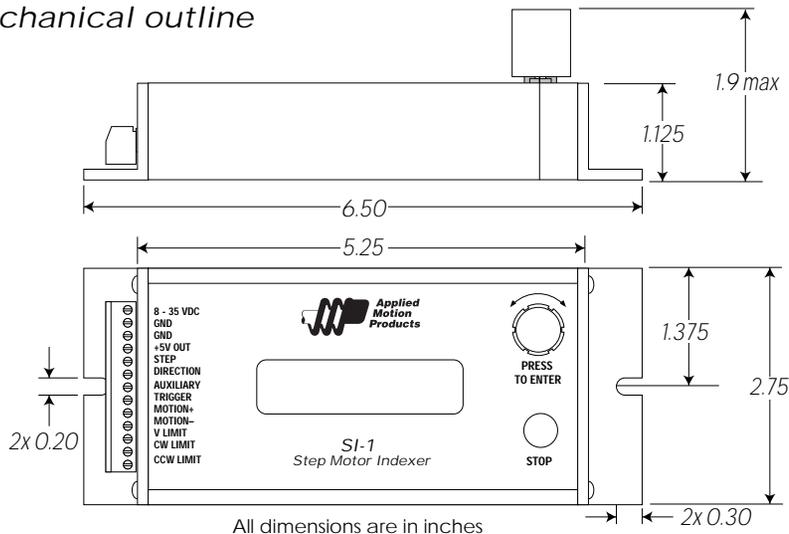
Inputs   2 limit switches, optically isolated, active low, 5 mA input current. Trigger and auxiliary, 5 - 24V digital logic, active low, -1 mA input current.

Outputs   Motion: optically isolated phototransistor. 24 V max, 20 mA max. Step and direction: open collector transistor, 24 V max, 100 mA max.
5V OUT: +5 VDC, 100 mA max. Self resetting fuse.

Physical   6.5 x 1.9 x 2.75 inches overall. Reversible mounting flange on each end allows mounting behind or on panel.   Two #10 screws required for mounting. 13 position pluggable, screw terminal connector. Power can also enter via 2.1 mm, center negative DC power jack. Stop switch, data entry knob, 2 x 16 character liquid crystal display.

Power Requirement   8 to 35 volts DC, 200 mA.

Mechanical outline

All dimensions are in inches

Applied Motion Products, Inc.
404 Westridge Drive Watsonville, CA 95076
Tel (831) 761-6555   (800) 525-1609   Fax (831) 761-6544

User's Manual

SI-1

Step Motor Indexer

8 - 35 VDC
GND
GND
+5V OUT
STEP
DIRECTION
AUXILIARY
TRIGGER
MOTION+
MOTION–
V LIMIT
CW LIMIT
CCW LIMIT

Applied Motion Products

PRESS TO ENTER

SI-1
Step Motor Indexer

STOP

SOFTWARE 2.1 VERSION

Applied Motion Products

motors • drives • controls

Locking the Program

The SI-1 includes a program lock feature so that one user can prevent others from making unauthorized changes to the program.

When an SI-1 is factory fresh, both programmer and operator have access to all parameters. Once the programmer has configured the SI-1 and returned to the "Running" prompt, lockout mode can be entered by pressing the programming knob while holding down the Stop button.

The SI-1 will ask the programmer "Lock program?". The proper response is yes or no. If yes is selected, the SI-1 will ask for a three letter password. The process of entering the password is the same as the process of naming a user unit. Having accepted the password, the SI-1 then asks, in sequence, whether the user should be allowed to change distance, speed and # cycles (also known as "Moves/trigger").

Finally, "Program locked" is displayed. The next time someone presses the programming knob, only the parameters that were selected during the lockout phase are presented to the user.

To remove the lock, press the programming knob while holding down the Stop button. The SI-1 will request a password and, if correct, will unlock the program.

Panel Mounting Template

Panel mounting template with dimensions:
- 0.60 in
- 2.37 in
- 1.833 in
- 0.355 in
- 4x R.08
- 2.482 in
- 5.150 in
- 6.20 in
- 5.00 in
- 0.710 in
- Ø.320
- 0.650 in
- Ø.425
- 1.175 in
- 2x Ø.220 or #10 tap
- optional large cutout

Introduction

Thank you for selecting an Applied Motion Products motor control. We hope our dedication to performance, quality and economy will make your motion control project 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 (800) 525-1609 or you can reach us by fax at (831) 761–6544.

Summary of SI-1 Features

Menu driven - no programming language to learn.
Can connect to any pulse & direction step motor driver.
All programs can be executed between 1 and 255 times, or nonstop, from a single trigger.
Ability to work in motor steps or units defined and named by the user, such as inches or revs.
Non-volatile memory saves your program and parameters during power down.
Built-in Stop switch allows user to interrupt motion.
Can be powered by 8-35 VDC power supply or optional WT-1 wall transformer.

Input Signals

TRIGGER - tells the SI-1 to begin executing the program
AUXILIARY - connection for sensor, jog switch or direction signal
V LIMIT, CW LIMIT, CCW LIMIT - limit & home switches or sensors

Output Signals

MOTION - indicates when SI-1 has motor "in motion" or "in position"
+5V - for motor drive optoisolator circuits
STEP - step pulses to motor drive
DIR - direction signal to motor drive

Motion Programs

Feed to Length moves a preset distance when TRIGGER is pulsed low (to 0 volts).
Feed & Jog also moves a preset distance. Jogs whenever AUX is held low.
Feed & Return moves a preset distance, then returns to the starting point.
Feed & Back Off moves a preset distance, then backs up a different distance.
Feed to Sensor moves until the AUX input changes state.
Feed to Sensor & Return moves until AUX changes state, then returns to the start.
Register & Feed moves until AUX changes state, then moves a preset distance.
Learn Speed allows the user to adjust & display speed "on the fly".

Motion Parameters

Distance from 1 to 8,000,000 steps.	Speed from 100 to 25,000 steps/second.
Accel/decel rates from 1000 to 255,000 steps/s/s	Return speed can differ from forward speed
Decel rate can differ from accel rate.	Jog speed can differ from forward speed
Time delay before return: 0 to 25.5 sec	Time delay between moves: 0 to 25.5 sec
Time delay between trigger and move: 0 to 510 ms	

Getting Started

To use your Applied Motion Products motor control, you will need the following:

• A DC power supply. You can use the WT-1 wall transformer from Applied Motion Products for this purpose or you may wire in your own 8 to 35 volt DC power supply. The indexer requires up to 200 milliamps of current.
• A pulse and direction step motor driver. Applied Motion Products models 2035, 2035 O, 3535, 3535 O, 3540 M, 5560, PD2035, PD5580 and PD6300 are all compatible with this indexer, as are many other drives.
• Some wire or cable for connecting the driver to the indexer
• A step motor that is compatible with your driver
• A small flat blade screwdriver (3/32" or 2 mm) for tightening the connectors (included with every SI-1)
• A trigger input to signal the indexer when to move. This can be a logic signal from a computer or PLC, or it can be a switch or relay.

The sketch below shows where to find the important connection and adjustment points. Please examine it now.
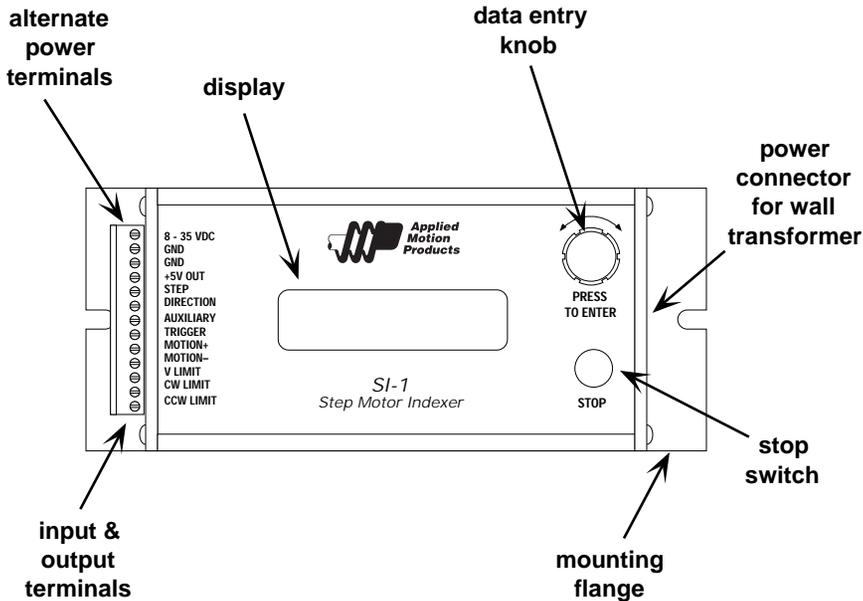
Mounting the Indexer

To mount the indexer in front of a panel, use a #10 screw through each mounting flange, as shown below.
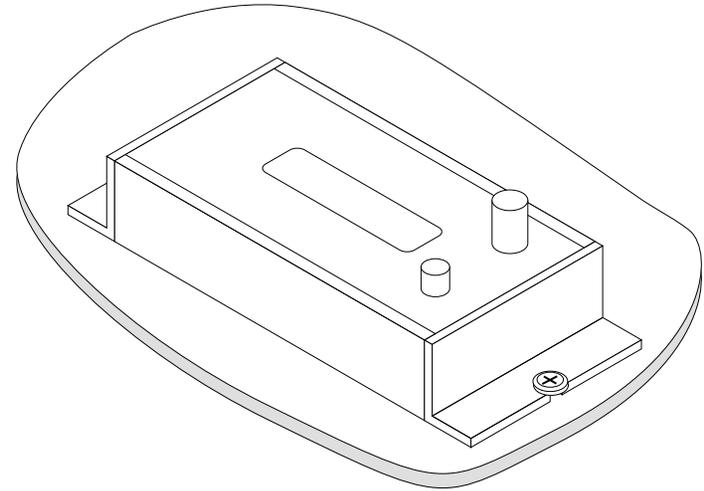
To mount the indexer behind a panel, you can reverse the mounting flanges as shown below. The template on page 19 is useful for determining the cutouts you'll need in your panel.
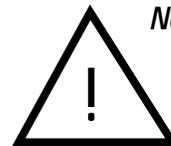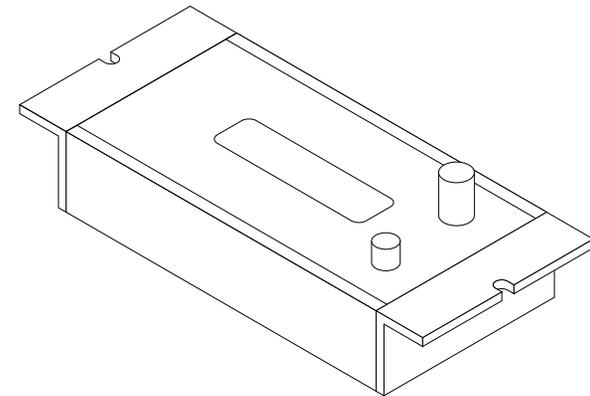
Never use your indexer in a space where there is no air flow or where the ambient temperature exceeds 50 C (122 F)
Never put the indexer where it can get wet.
Never allow metal particles near it.

Set Accel Rate
Set Decel Rate

All programs ask this. Learn Speed asks for Accel/Decel as one parameter, so they have to be the same. For any other program, accel rate and decel rate are asked separately and do not have to be the same. In some applications, such a bottle filling, it is useful to have a high acceleration rate to start the filling as quickly as possible. A slower decel rate helps prevent spilling as the liquid level enters the neck of the bottle.

Turn the knob to adjust the acceleration (and deceleration) rate. A range of 1000 to 255,000 steps/second/second is allowed. The higher the accel rate, the more torque you'll need to accelerate the load. But don't set the rate too low, or you might run into resonance on the way up to speed. You'll probably want to experiment with this setting. The Feed & Return program can make that very easy for you if your system has limited travel because it always returns the motor to the starting position. An acceleration rate of 3000 steps/sec/sec works for most applications. Press the knob when you've got the accel rate you want.

Learn speed is also a useful program for experimenting with accel and decel rates as well as speed.

Saving Your Program

When you press the data knob to enter your choice for the last item in any of the three menus, the programming is complete. The indexer automatically saves the new information and returns to "Running" mode. *If you remove power from the SI-1 before this step, your changes will be lost.*

Outputs to Driver

+5V OUT: +5 volts DC, 100 mA output. Intended to drive the anodes of optically isolated step motor drives.

STEP: Open collector output for connection to step motor driver. The step pulse is active low, 10 microseconds minimum. 50 volts max. Can sink up to 100 mA.

DIRECTION: Open collector output for connection to step motor driver. Direction set up time is 50 microseconds minimum. 50 volts max. Can sink up to 100 mA. Goes low (0 volts DC) when direction is CCW.

Connection to Applied Motion Products Driver
To connect to an Applied Motion driver, or most industry standard pulse and direction drives, follow the instructions below.

+5V OUT	————	+5V
STEP	————	STEP
DIRECTION	————	DIR
Indexer		Driver
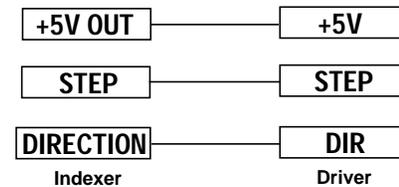
Connections to Applied Motion Products Driver models 2035, 2035O, 3535, 3535O, 3540M, 5560, PD2035, PD5580

Notes:
1. Models 2035 O, 3535 O: set the step/slew jumper to the STEP position.
2. Model PD2035: set the 5V/24V switch to 5V and the BYPASS switch to BYPASS.
3. Model PD5580: set the 5V/24V switch to 5V.
4. Models PD2035, PD5580: +5V terminal is labeled "V OPTO."

For Model PD6300 (and other drives with differential inputs) follow the sketch below.

		STEP+
+5V OUT	———•————	DIR+
STEP	————	STEP-
DIRECTION	————	DIR-
Indexer		Driver
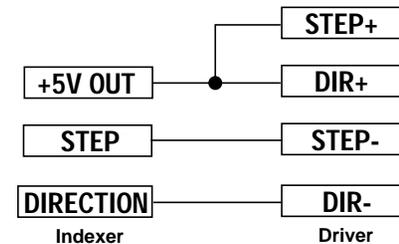
Connections to Applied Motion Products Driver model PD6300 (and other differential input drives)

Control Inputs

All of the inputs are active low, but some are optically isolated (cw limit and ccw limit) and others are not (trigger and auxiliary). This affects the way you can connect circuitry to them.

TRIGGER

The trigger input signals the indexer to begin moving the motor according to the parameters you've selected. Motion begins when the trigger input goes low. This is done by connecting the TRIGGER terminal to one of the GND terminals. You can use a switch, a relay or a transistor to do this. You can also use active logic to drive the trigger input as long as your logic is grounded to one of the GND terminals. Your logic can be 5, 12 or 24 volts. The schematic diagram of the TRIGGER input is shown on page 7.

The indexer will not respond to the data entry knob unless TRIGGER is in the high state. Open circuit is the same as the high state.

In the presence of high electrical noise, the SI-1 may "false trigger," executing programs when you don't want it to. If this is happening to you, try adding a capacitor between the TRIGGER and GND inputs as shown below.
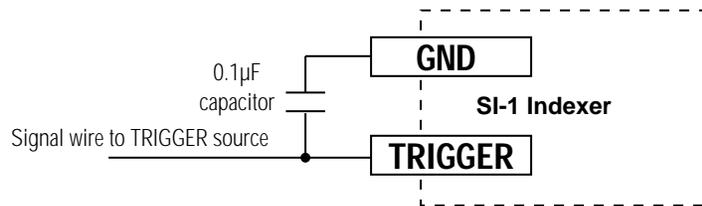
Capacitor to Prevent False Triggering in Noisy Environments

AUXILIARY

The purpose of this input depends on which program you choose.
• FEED TO LENGTH, FEED & RETURN and FEED & BACK OFF programs: you can choose AUX as the feed direction. You will then be able to control the feed direction by setting the AUX input high or low (low = ccw).
• FEED TO SENSOR, FEED SENSOR RETURN and REGISTER & FEED programs: you connect your sensor to the AUX input.
• FEED AND JOG program: the SI-1 jogs the motor anytime AUX is low.

Set Feed Distance

The Feed to Length, Feed & Jog, Register & Feed, Feed & Return and Feed & Back Off programs need to know a distance to move. The range is 1 to 8,388,608 steps. The knob is speed sensitive when you enter the distance. This is so you don't have to turn the knob thousands of times. As a result, the indexer is a little sensitive when entering distances. You'll eventually develop a "feel" for it, and hopefully find it easy.

Feed & Back Off will also ask for a BACK DISTANCE. This tells the SI-1 how far to back off after moving the FEED DISTANCE.

Register & Feed places a lower limit on the FEED DISTANCE because the motor needs to move enough steps to decelerate to a stop. See Register & Feed on page 18 for more information.

Set Feed Speed

All programs ask this.

You can adjust the speed between 100 and 25,000 steps/second in increments of 100.

Programs that return, such as Feed & Return, Feed to Sensor & Return, and Feed & Back Off will ask for a return (or back) speed.

Feed & Jog asks for the jog speed.

Set Feed Dir

All programs ask this.
You have three choices for direction. Turn the knob until you see the direction you want, then press the knob.
• If you choose Clockwise (cw) the indexer will set the DIR output high when feeding and low when returning.
• Counter-clockwise (ccw) sets the DIR output low for feeds and high for returns.
• AUX makes the indexer direction follow the AUXILIARY input for feeds. DIR is reversed for the return. This is true even if you change AUX before the motor returns. AUX is sampled by the indexer just after TRIGGER goes low and is not sampled again until the next time TRIGGER goes low.

Feed & Back Off

This program is just like Feed & Return except that the return distance (referred to as BACK DISTANCE in the menu) does not have to be the same as the FEED DISTANCE. This is useful for metering pump applications where you may want the pump to "back off" slightly after filling a container so that fluid does not leak out of the dispensing tube. The back direction is also independent of the forward direction, so if you wish, you can do both moves in the same direction or in opposite directions.

Register & Feed

This program is similar to Feed to Sensor, but you can set the exact distance that the motor moves after the sensor sees the registration mark. It is useful for positioning applications where a registration mark must first be located, such as label dispensing. The SI-1 can be set to find the rising or falling edge of a sensor, in the System menu.

Since the motor is moving when the registration mark is found, the SI-1 requires a minimum distance to decelerate to a stop. For this reason, if you choose Register & Feed the SI-1 asks you to set acceleration, deceleration and speed before distance. It then places a lower limit on the distance. For example, if you set the speed for 1000 steps/second and the decel rate at 10,000 steps/s/s, the SI-1 will need at least 50 steps to stop. Therefore the SI-1 would not let you set distance to less than 50 steps.

If you find that you must stop in less distance than the SI-1 allows, try increasing the decel rate or lowering the speed. In the example, if you doubled the decel rate to 20,000 steps/s/s, the motor could stop in half the distance, which is 25 steps.

Learn Speed

Sometimes it is useful to be able to adjust the motor speed while it's running. For example, you may wish to search for speeds where the system runs quietly, or you may want to test the torque of the motor at various speeds. Or maybe you just want to know how fast it can go. Learn speed can be used for all these things.

Once you've entered the parameters, simply apply a trigger pulse, and the motor will accelerate to the speed you've chosen. That speed will be displayed, and if you turn the knob, the speed and display change. If you find a speed you like and want to use it in your program, press the knob and the SI-1 will learn the new speed.

Depending on which program you choose, you will be asked up to eight additional questions in the Program menu.

The AUX input has the same electrical characteristics as the TRIGGER input.
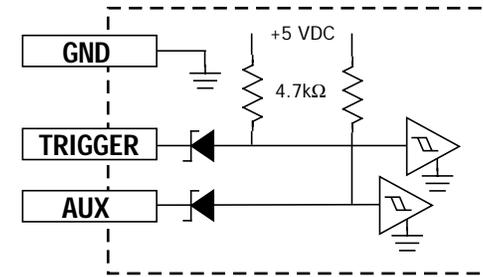
Schematic Diagram of Trigger & Aux Inputs

## CW LIMIT, CCW LIMIT, V LIMIT

These three terminals are where you connect your limit switches and limit switch power supply.
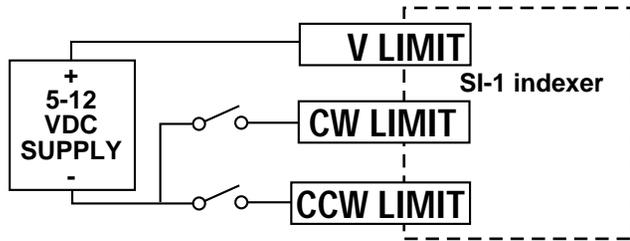Limit switches allow you to define places where you don't want the motor to go.

If you won't be using limit switches, just leave the three LIMIT terminals open. And answer NO to the HOME ON PWR UP? question.

The limit inputs are optically isolated. This feature improves the noise immunity of the system, increasing the chances that everything will work as you expect. Because the limit switch circuit is electrically isolated from the indexer, you'll need a separate power supply for the switches. In some cases you can use the built in 5 volt supply but doing so opens a path for electrical noise to travel from the limit switch circuit into the SI-1. Call the factory before using the built in supply for the limit switches.

If your switches are normally open, you're in luck. This is the easiest type to use. Normally open means that the switch is an open circuit unless the motor is at the limit, at which time the switch closes. The figure on page 8 shows the proper wiring. Make sure you don't reverse the limit switches or they won't work at all. The best way to test the system is to intentionally run the motor into one of the limit switches, with your finger ready to press STOP if the motor doesn't stop at the switch. If the motor stops, the switches are correct. If the motor doesn't stop, swap the CW LIMIT and CCW LIMIT connections.
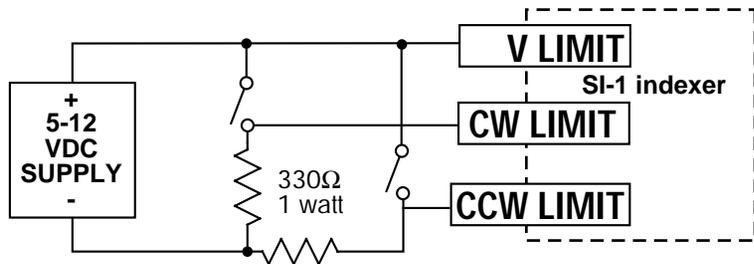
V LIMIT

680Ω

CW LIMIT

CCW LIMIT

SI-1 indexer
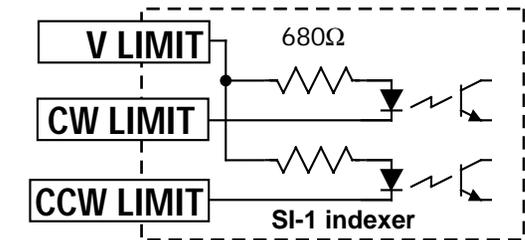
Schematic Diagram of Limit Switch Inputs

+ 5-12 VDC SUPPLY -

V LIMIT

SI-1 indexer

CW LIMIT

CCW LIMIT

Connection Diagram for Normally Open Limit Switches

If your switches are normally closed, the connections are a little more difficult. Please follow the sketch below.

+ 5-12 VDC SUPPLY -

330Ω 1 watt

V LIMIT

SI-1 indexer

CW LIMIT

CCW LIMIT

Connection Diagram for Normally Closed Limit Switches

You may also use the limit switch inputs to set up a remote STOP switch. Follow the sketch below.

+ 5-12 VDC SUPPLY -

normally open momentary switch

V LIMIT

SI-1 indexer

CW LIMIT

CCW LIMIT
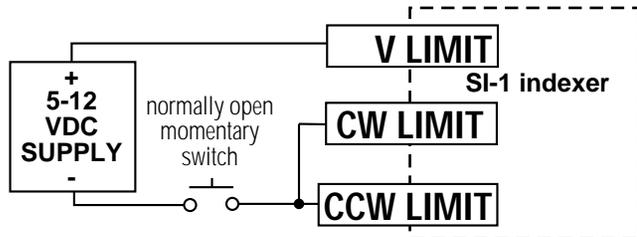
Connection Diagram for Remote STOP Switch

Feed To Sensor

Feed to Sensor accelerates the motor to the speed you've chosen and runs until the AUX input changes state. You can choose between rising and falling state changes in the System menu. If you used this program in a previous version of the SI-1, setting the sensor edge for "falling" will work the same way it did before. With a sensor connected to the AUX input, the motor will run until the sensor is tripped, *then decelerate to a stop.* The sensor can be one of many types. For feeding material or moving the motor to a specific location, a sensor that is blocked by the motor's travel is needed. If you are filling containers with liquid a fluid sensor can be connected to the indexer.

Feed To Sensor & Return

This program performs the same feed move as the Feed to Sensor Program, then waits according to the RETURN DELAY before returning to the starting point.

Feed & Jog

This is similar to the Feed & Return program. The indexer will ask you to set the acceleration rate, a top speed, the distance and a direction for the feed move. Each time you take the TRIGGER input low, the indexer will move the motor as you've described. You will also be asked to set the speed, direction and acceleration rate for jogging. Whenever AUX is low (0 volts) the SI-1 will move the motor according to the jog parameters. This is useful for cut to length applications when you need to manually move the system while loading new material.

Feed & Jog can also be used for a run-stop mode. If you select Feed & Jog and wire a switch to the AUX input as shown below, you can make the motor run and stop using the switch.

AUXILIARY

switch shown in STOP position

GND
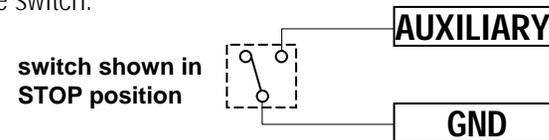
Connection Diagram for Run-Stop (Jog) Mode

Feed & Return

This program is similar to Feed To Length: when TRIGGER goes low, the indexer moves the motor as specified. When TRIGGER returns to the high state, the indexer returns the motor to its original position. During the return move the same distance is traveled (but in the opposite direction) and the same accel rate is used.

The top speed for the return move is the RETURN SPEED parameter, which can be different than the FEED SPEED. After feeding, the indexer waits according to the RETURN DELAY parameter before the return move begins.

Set Repeat Delay

If you set MOVES/TRIGGER to any value other than 1, you need to set the time delay between moves. This can be set between 0 and 25.5 seconds, in increments of 0.1 seconds. Most step motor systems will need at least 0.2 seconds of delay to completely stop moving, so you generally won't set the REPEAT DELAY below that.

Set Return Delay

If you choose the Feed & Return, Feed & Back Off or Feed to Sensor & Return program, you will be asked for a RETURN DELAY. This is the time delay after the feed, but before the return move. This can be set between 0 and 25.5 seconds, in increments of 0.1 seconds. Most step motor systems will need at least 0.2 seconds of delay to completely stop moving, so you generally won't set the RETURN DELAY below that.

Program Menu

The last, and most important of the three menus is the program menu. It lets you set motion parameters such as speed, distance, direction and acceleration. The program menu is also where you select which one of the eight programs you want to use.

Depending on which program you select, you will be asked up to 8 other questions. Your selection of program also affects which questions you are asked in the System and Timing menus, so you may want to take another look at those menus after your first trip through the Program menu.

Select Program

The SI-1 has eight programs to choose from. They are explained below.

Feed To Length

This is the simplest program. The indexer will ask you to set the acceleration rate, a top speed, the distance and a direction. Each time you take the TRIGGER input low, the indexer will move the motor as you've described. If you set the direction to AUX, the indexer will set the direction output the same as the AUX input.
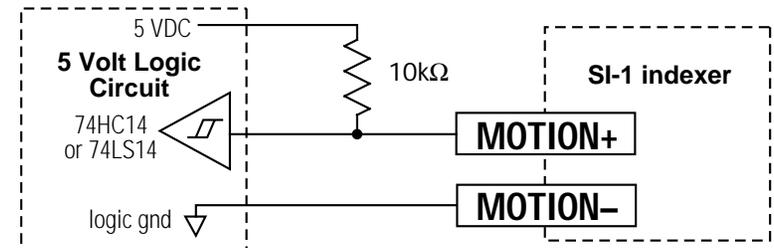
The Motion Output

This is an open collector, open emitter photo transistor output that can be programmed to turn on whenever the motor is moving ("In Motion") or to send a pulse at the end of a move ("In Position"). It is open all other times. You can connect the motion output to 5, 12 or 24 volt circuitry. Just make sure you add enough resistance to the circuit to limit the current to a maximum of 10 milliamps. And always keep MOTION+ more positive than MOTION-.
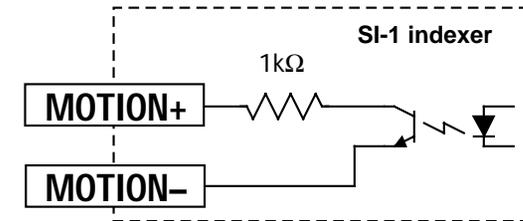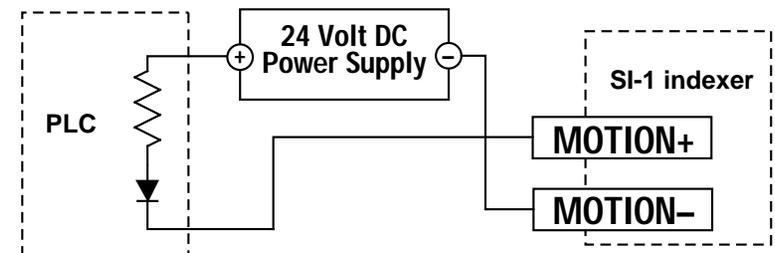

Schematic Diagram of Motion Output

If you plan to connect the MOTION output to a voltage higher than 12 volts, add 100 ohms of series resistance for each volt above 12 volts. Two examples for using the MOTION output follow.


Connecting the Motion Output to 5 Volt Logic

Connecting the Motion Output to PLC Input

Programming

Each time you apply power to your indexer, it will display the words "Applied Motion Products" and the software version number for about one second. It will then read whatever program and parameters were last stored in nonvolatile memory.

data entry knob

PRESS
TO ENTER
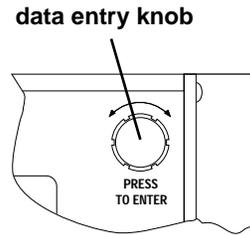
If your indexer hasn't been turned on since it left the factory, it will wake up to the factory installed parameters. The first thing you'll see after Applied Motion Products are the words "Running Feed to Length." We always ship the indexers with a short Feed to Length program.

If the indexer receives a trigger signal it will execute the program. Programs always start by the trigger input going to a low voltage state. Switching trigger to ground takes it to a low state. If the trigger input is open circuit, it will be in the high state.

If you press the data entry knob, the indexer will take you through various menus so you can select a new program or new parameters. You should take time to familiarize yourself with the data knob. It can be turned to adjust parameters or to scroll a menu. Pressing the knob confirms your selection and takes you to the next menu.

The menus are outlined on the following pages. The SI-1 indexer is designed to be so easy that you won't need this manual for programming. However, we still recommend that you read this manual once and then put it in a safe place.

Select Menu

This is the first question you'll be asked after leaving the "Running" screen. There are three menus to chooose from:

System Menu
This menu asks you to set parameters that affect the entire system, such as what units to display information in or whether to seek home on power up. The next page discusses each system menu item in detail.

Home on Pwr Up?

If you wish, the indexer can move to a known position each time it is powered up. If you set the homing to **CW**, the indexer will move the motor in the cw direction until the cw limit switch input goes low. Choosing **CCW** will have the opposite effect. Choose **NO** if you don't want the indexer to move the motor to a limit switch on power up.

If you do not have limit switches connected to the indexer, always answer this question **NO**.

If you select a home direction, make sure you have the limit switches wired correctly. The motor will run past the limits if you get the switches backwards, and you'll have to press the stop switch.

The SI-1 will also ask for a home speed. The SI-1 homing sequence has no accel/decel ramping, so you must limit the home speed to the start-stop (or pull-in) rate of the motor, typically 5 rev/sec or less. The homing sequence has no speed ramping so that it can stop in one step, assuring that "home" is always in the same place. This technique also prevents the motor from decelerating past the limit switch and stopping in a position that is outside the limits.

Timing Menu
The second of the three menus is the timing menu, which asks you to set parameters that affect the system timing.

Moves/Trigger

All programs ask this. The SI-1 can execute up to 255 moves each time you pulse the TRIGGER input low. It can also repeat the move indefinitely, which we call NONSTOP. If you select NONSTOP, you'll have to press the STOP button or activate a limit switch to stop the program.

Set Trigger Delay

If you wish, you can add delay between the time you issue the trigger pulse and the SI-1 begins moving the motor. This is useful for syncronizing the SI-1 to another process, such as cutting or printing. The range of TRIGGER DELAY is 0 to 510 milliseconds. You will normally set the TRIGGER DELAY to 0.

Name Your Unit

You must now enter a name for your unit. It can be up to three letters. A through Z are available along with the blank character. The letters are entered individually, scrolling through the letters with the knob. If you've ever entered your initials into a video game, you already know what to do, so feel free to skip the next paragraph.

When the SI-1 asks you to "name your unit," you will see three characters on the 2nd line of the display. The cursor will be under the left most character. As you turn the knob, the character will change. When you find the letter you want, press the knob. The cursor will then move to the middle letter. Repeat until you have chosen all three letters. The SI-1 will then proceed to the next question.

Examples of user unit names are "REV" for revolutions and "IN" for inches. Note that "IN" uses only the first two characters, and the third character is blank.

Steps/Unit?

For the SI-1 to work in your units, you must tell it the pitch, or conversion constant. This number is determined by the step resolution of your driver and any mechanical linkage to the load.

For example, if your driver is set to half step and you want to work in revolutions, enter 400, because there are 400 half steps in a revolution.

If you are full stepping (200 steps/rev) and you have a 10:1 gearhead between the motor and load, you could work in revs by setting Steps/Unit to 2000.

If you have a lead screw, and want to work in inches, enter the steps/rev divided by the screw pitch. For example, if your screw pitch is 0.2 inches/rev and the driver is set for half step (400 steps/rev) then the Steps/Unit is 400/0.2 = 2000.

Set Sensor Edge

If you choose the program *Feed to Sensor*, *Feed to Sensor & Return* or *Register & Feed*, you need to tell the SI-1 which edge of the sensor to look for. The choices are *rising* and *falling*. If you want the SI-1 to search for the point where your sensor makes the AUX terminal go from 5 volts to 0 volts, choose *falling*. The sensor edge where the AUX voltage changes from 0 to 5 is the *rising* edge.

Set Motion Signal

This is the first question you'll be asked after selecting "System Menu". There are four choices:

In Motion tells you when the motor is moving. The MOTION output becomes active (closed) anytime the motor is moving, and is open at all other times.

In Position Out sends a pulse on the MOTION output at the end of a Feed move, signaling that the motor is in position. If you select "In Position Out", the Feed to Length, Feed & Jog, Feed to Sensor and Register & Feed programs will send a pulse at the end of the move. For Feed & Return, Feed & Back Off and Feed to Sensor & Return, a pulse is sent at the end of the first part of the move, but not after the return or back off move.

In Position Back sends a pulse on the MOTION output at the end of a return or back off move. This is useful for the Feed & Return, Feed & Back Off and Feed to Sensor & Return programs to tell you when the motor has arrived at the final position.

In Position Both sends pulses on the MOTION output at the end of a Feed to Length, Feed & Jog, Feed to Sensor and Register & Feed program, and pulses at both ends of Feed & Return, Feed & Back Off and Feed to Sensor & Return programs.

If you choose one of the "In Position" options, you'll be asked to set the pulse width. The range is 0.1 to 25.5 milliseconds. Set this parameter according to the requirements of the equipment you want to connect to the MOTION output.

User Units?

The SI-1 can work in motor steps or units that you define. If you want to work in steps, answer NO to this question. If you want to define your own units, answer YES. If you select YES, you will be asked two more questions, which are explained on page 14.

SI-1 Menu Tree

SOFTWARE VERSION 2.1

START → Applied Motion Products V2.0 → Running → Select Menu → Program Menu → Select Program

Timing Menu
- Moves/Trigger? 1-255 or nonstop
- Set Trigger Delay 0-512 msec
- Set Return Delay 0-25.5 sec
- Set Repeat Delay 0-25.5 sec

Register & Feed
- Set Feed Speed 100-25000 steps/sec
- Set Feed Dir cw - ccw
- Set Accel 1000-255000 steps/s/s
- Set Decel 1000-255000 steps/s/s
- Set Feed Distance 1-8000000 steps

Feed to Sensor
- Set Feed Speed 100-25000 steps/sec
- Set Feed Dir cw - ccw
- Set Accel 1000-255000 steps/s/s
- Set Decel 1000-255000 steps/s/s

Feed to Sensor & Return
- Set Feed Speed 100-25000 steps/sec
- Set Feed Dir cw - ccw
- Set Accel 1000-255000 steps/s/s
- Set Decel 1000-255000 steps/s/s
- Set Return Speed 100-25000 steps/sec

Feed & Back Off
- Set Feed Speed 100-25000 steps/sec
- Set Feed Distance 1-8000000 steps
- Set Feed Dir cw - ccw - aux
- Set Accel 1000-255000 steps/s/s
- Set Decel 1000-255000 steps/s/s
- Set Back Distance 1-8000000 steps
- Set Back Speed 100-25000 steps/sec
- Set Back Dir cw - ccw

Feed & Return
- Set Feed Distance 1-8000000 steps
- Set Feed Speed 100-25000 steps/sec
- Set Feed Dir cw - ccw - aux
- Set Accel 1000-255000 steps/s/s
- Set Decel 1000-255000 steps/s/s
- Set Return Speed 100-25000 steps/sec

Feed & Jog
- Set Feed Distance 1-8000000 steps
- Set Feed Speed 100-25000 steps/sec
- Set Feed Dir cw - ccw
- Set Accel 1000-255000 steps/s/s
- Set Decel 1000-255000 steps/s/s
- Set Jog Speed 100-25000 steps/sec
- Set Jog Dir cw - ccw
- Set Jog Accel 1000-255000 steps/s/s

Feed To Length
- Set Feed Distance 1-8000000 steps
- Set Feed Speed 100-25000 steps/sec
- Set Feed Dir cw - ccw - aux
- Set Accel 1000-255000 steps/s/s
- Set Decel 1000-255000 steps/s/s

Learn Speed
- Set Feed Speed 100-25000 steps/sec
- Set Feed Dir cw - ccw - aux
- Set Accel 1000-255000 steps/s/s

System Menu
- Set Motion Signal
  - In Position out - back - both
  - In Motion
- Set Pulse Width 0.1-25.5 msec
- User Units?
  - No
  - Yes
- Steps/Unit? 1-65535
- Enter Unit Name (3 chars)
- Home On Pwr Up? cw - ccw - no
- Set Sensor Edge rising - falling
- Set Home Speed 100-25000 steps/sec