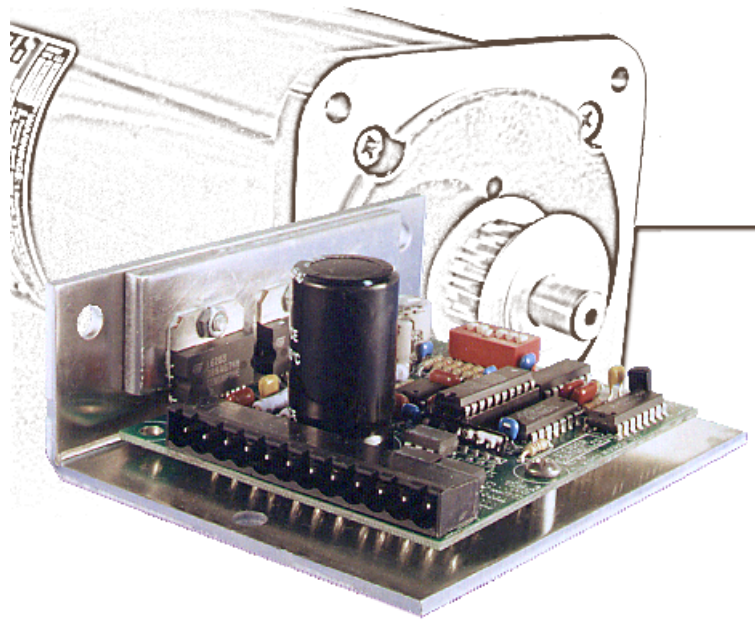
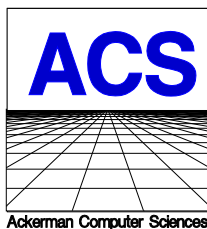


# ACS Stepper Controller & Econo Stepper Controller

*User's Manual*



6/8/96



*On The Cutting Edge of Technological Evolution*

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# Introduction

Both the **ACS Stepper & ACS EconoStepper Drivers** are low cost, high performance stepper driver modules employing state of the art design and construction methods. They are powerful enough to handle the most critical applications, yet they are extremely small, require little effort to interface and operate.

The **ACS Stepper Driver** was designed for use with high performance, low inductance motors and provides up to 400 steps per revolution with a 1.8 degree motor or 800 steps per revolution using a .9 degree motor. The 32 different current settings (binary selectable) are built into the driver and can be changed at any time, even while it is in operation! Continuous operation currents from .2 to 4 Amps per phase, with non-continuous operation up to 5 Amps per phase. The user will be delighted to find that he need not reset the driver to change full or half step operation.

The **ACS EconoStepper Driver** was designed for use with high performance, low inductance motors and provides up to 400 steps per revolution with a 1.8 degree motor or 800 steps per revolution with a .9 degree motor. The output current is fixed at 1.2 Amp per phase. Full or half step operation can be achieved by cutting a jumper on the board.

System efficiency and high speed performance can now be improved through the use of low inductance stepper motors in conjunction with either the **ACS Stepper Driver** or the **EconoStepper Driver**. Older drivers that require higher chopping rates often cause the motors to operate at a higher temperature. Both of the **ACS Stepper Drivers** employ circuits that minimize ripple current, yet maintain a 20 kHz chopping rate, thereby reducing or eliminating the problem.

Use the either of the **ACS Stepper Drivers** to provide the muscle in your automation. Uses include robotics, automation, angle critical movements and absolute positioning control. These drivers have been providing reliable, trouble free operation for many customers for over 7 years.

Connection and interface are simple and straight forward. Simply connect the two phases of the stepper motor, the power supply, the optically isolated 5-12V Step/Enable/Direction control signals and you're in business.

## Features:

- State of the Art Design and Construction
- Designed for Use with High Performance,
- Low Inductance Motors
- 20 kHz Chopping Rate
- Up to 400 Steps per Revolution using a 1.8 or 800 Steps per Revolution using a .9 Degree Motor
- Full or Half Step Output
- Up to 10 kHz Step Clock Rate
- High Output Current (3.5 Amps RMS per Phase)
- 32 User Selectable Current Settings
- Opto-Isolated Inputs(20mA Each)
- High Input Voltage (35VDC)
- Over Temperature Protection Circuit
- Automatic ½ Current Reduction Circuit After 1 Second of no Step Inputs
- Single Supply
- Small Size (4.5"W x 2"H x 3.5"D including heatsink or 3.75"W x 1.75"H x 3"D without)
- Economically Priced

## Block Diagram

## Model Selection

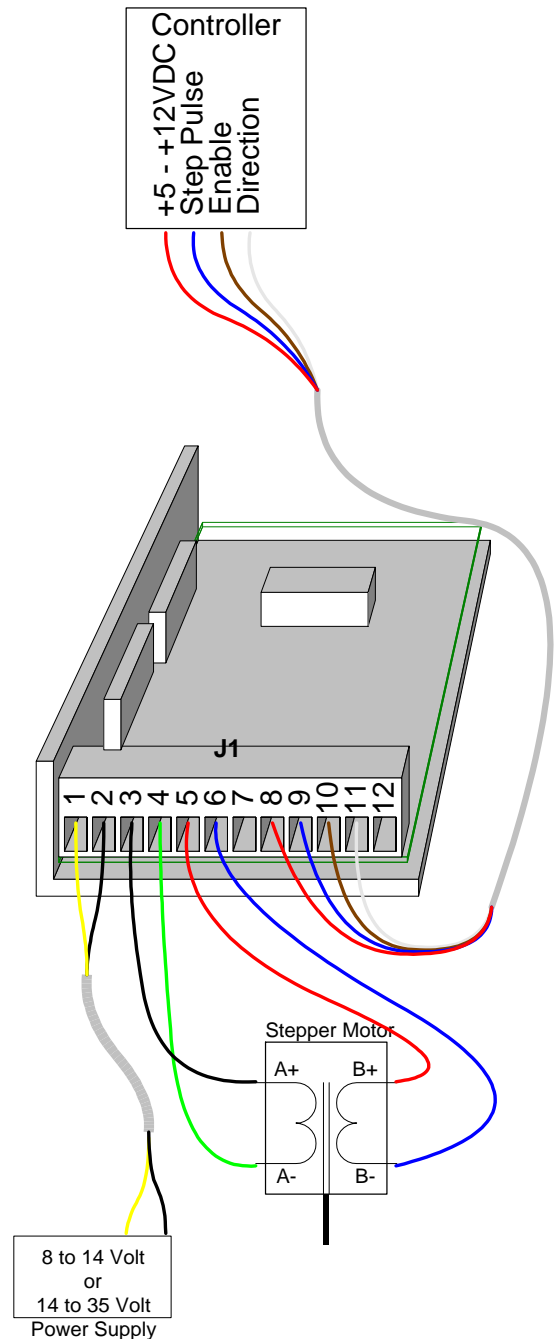
There are four models in total:

**Stepper Controller** - Binary selectable current settings using DIP switch, Max 5 Amps per Phase, Input Voltage 8 - 14 volts

**Stepper Controller 24V** - Binary selectable current settings using DIP switch, Max 5 Amps per Phase, Input Voltage 14 - 35 volts

**Econo Stepper** - Fixed current settings, 1.2 Amps per Phase, Input Voltage 8 - 14 volts

**Econo Stepper 24V** - Fixed current settings, 1.2 Amps per Phase, Input Voltage 14 - 35 volts



Typical Installation

## DIP Switches & Jumpers

### Stepper Controller

Switch #	Name	OFF	ON
#1	¼ Amp Per Phase	-	Adds ¼ Amp Per Phase
#2	½ Amp Per Phase	-	Adds ½ Amp Per Phase
#3	1 Amp Per Phase	-	Adds 1 Amp Per Phase
#4	2 Amp Per Phase	-	Adds 2 Amp Per Phase
#5	1 ¼ Amp Current Boost*	-	Adds 1 ¼ Amp Current Boost*
#6	HALF / FULL Step	HALF Step	FULL Step

\* **Should Only Be Used For Non-Continuous Duty Operation!**

Care should be taken when selecting the motor phase current. Motor temperature rise should be measured, and verified that it is within the specifications of the manufacture!

### Econo Stepper

There is only one jumper on the Econo Stepper, and that is to select FULL or HALF step operation. The jumper must be cut to select half step operation. It is marked on the top of the PCB near the middle of the front edge. Once cut, a solder bridge or small gauge wire must be soldered across the cut to restore FULL step operation.

## PIN Outs / Connections

### Stepper Controller

J1 Pin #	Name	
#1	+VDC (8-14VDC or 14-35VDC)	
#2	GND (Ground)	
#3	A+	
#4	A-	
#5	B+	
#6	B-	
#7	No Connection	
#8	+5VDC - +12VDC for Inputs	This supply may be isolated from the Stepper Motor Supply!  These inputs provide isolation from logic control circuits.
#9	Step Input (20mA Sink)	
#10	Enable Input (20mA Sink)	
#11	Direction Input (20mA Sink)	
#12	Half Power Input (20mA Sink)	

## Econo Stepper

J2 Pin #	Name
#1	+VDC (8-14VDC or 14-35VDC)
#2	GND (Ground)
#3	A+
#4	A-
#5	B+
#6	B-

J1 Pin #	Name	
#1	+5VDC - +12VDC for Inputs	This supply may be isolated from the Stepper Motor Supply!
#2	Step Input (20mA Sink)	
#3	Enable Input (20mA Sink)	These inputs provide isolation from logic control circuits.
#4	Direction Input (20mA Sink)	

ACS'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF ACS. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.