

# USC-48-2

## DUAL DRIVER UNIVERSAL SPEED CONTROL BOARD

### QUICK REFERENCE







#### USC-48-2 Quick Reference/ Installation Guide

The primary function of this guide is to acquaint the user with the specifications, basic wiring and configuration of the USC-48-2 Dual Driver Universal Speed Control Interface Board. The full product manual is available in Acrobat PDF format on the IMS Product CD. It also may be downloaded from the IMS web site at [www.imshome.com](http://www.imshome.com).

#### Notes And Warnings

Please observe the following when handling, connecting and using your USC-48-2 Universal Speed Control Board. Failure to observe these points may result in damage. All warranty and disclaimer information is located in the full product manual and should be referenced for more information.

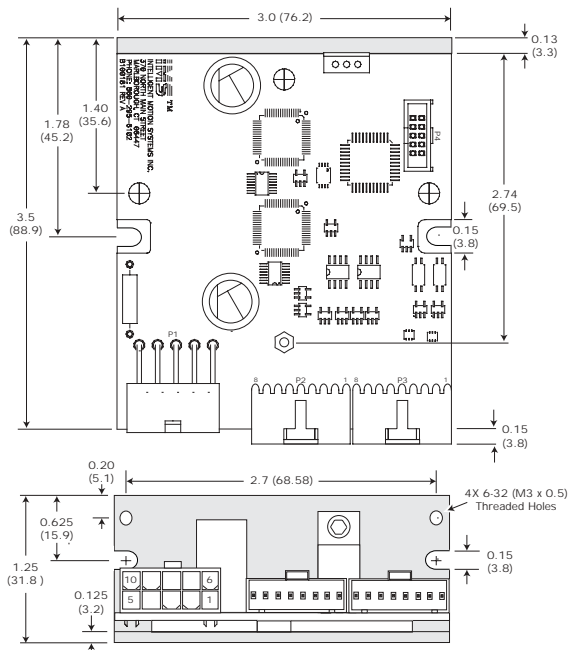
-  The USC-48-2 Universal Speed Control Board components are sensitive to Electrostatic Discharge (ESD). All handling should be done at an ESD protected workstation.
-  Hazardous Voltage Levels may be present if using an open frame power supply to power the USC-48-2.
-  The Power Supply output voltage must not exceed the maximum input voltage of the USC-48-2.
-  Do not apply power to the USC-48-2 without proper heat sinking or cooling. The maximum rear plate temperature of the USC-48-2 is 70°C!

#### Thermal Specifications

	Range
Ambient Temperature	0 to +50°C
Storage Temperature	-40 to +125°C
Maximum Heat Sink Temperature	+70°C

#### USC-48-2 Mechanical Specifications

Dimensions in Inches (mm)



#### Electrical Specifications

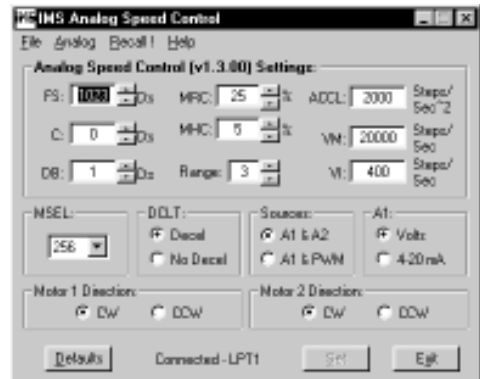
Speed Control Input 1	0 to +5 VDC or 4 to 20 mA
Speed Control Input 2	0 to +5 VDC
A/D Resolution	10 bit
Speed Control Potentiometer Resistance	10 kΩ
Input Voltage (+V) Range	+12 to +48 VDC
Step Clock, Direction Out (Drain Source Voltage Max)	100 VDC
Step Clock, Direction Out (Continuous Drain Current)	100 mA
Isolated Inputs	Speed1/Speed2/PWM, Start/Stop, Direction, SCLK In, Enable
Isolated Input Voltage Range*	5 to 24 Volts
PWM Input Frequency	15 to 25 kHz
Output Frequency	100 kHz

\*Sourcing or Sinking

#### Configuration Utility

The IMS SPI Interface GUI is an easy to install and use single screen interface. The Configuration Utility features include:

- Easy installation.
- Automatic communications configuration.
- Will not set out-of-range values.
- Tool-tips display valid range setting for each option.
- Easy single screen interface.



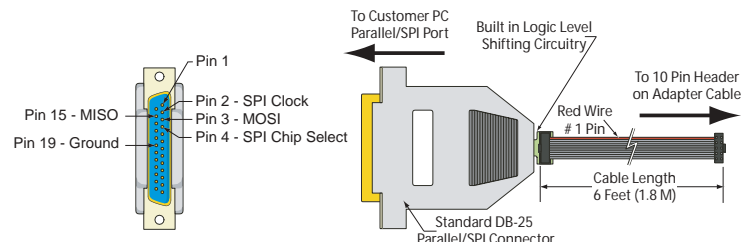
#### Setup Parameters

NAME	FUNCTION	RANGE	UNITS	DEFAULT
ACCL	Accel/Decel	2000 to 65,000	steps/sec <sup>2</sup>	2,000
C	Joystick Center	0 to 1022	counts	0
DB	Deadband	0 to 255	counts	1
DCLT	Decel Type	Decel at ACCL Rate/No Decel	--	Decel
	Source	A1 and A2, or PWM	--	0
	Analog Input	Voltage/4-20mA	--	0
IMODE	Clockwise/Counter Clockwise 1	0 or 1	--	0
	Clockwise/Counter Clockwise 2	0 or 1	--	0
	Full Scale	1 to 1023	counts	1,023
MHC	Hold Current	0 to 100	percent	5
MRC	Run Current	1 to 100	percent	25
MSEL	Microstep Resolution	2, 4, 5, 8, 10, 16, 25, 32, 50, 64, 125, 128, 250, 256	μsteps per step	256
RANGE	VI/VM Range	1 to 8	--	3
VI	Initial Velocity	1 to 99,999	steps/sec	400
VM	Maximum Velocity	2 to 100,000	steps/sec	20,000

All parameters are set using the included IMS SPI Interface and may not be changed on-the-fly. The following optional cables are recommended with the first order.

#### Parameter Setup Cable

A low cost accessory which eliminates the need for the user to wire communications. Included in this cable is built-in logic level shifting circuitry to accommodate the 3.3v ports on some PCs. Order Cable Part No. **MD-CC100-000** to connect the USC-48-2 to a standard DB-25 PC Parallel/SPI port.



#### Prototype Interface Cables

To expedite interfacing to the USC-48-2, there are two Prototype cables. One for power and the other for logic signals.

Power Cable Part Number ..... ADP-4210-FL  
Signal Cable Part Number (2 Required) ..... ADP-2508-FL

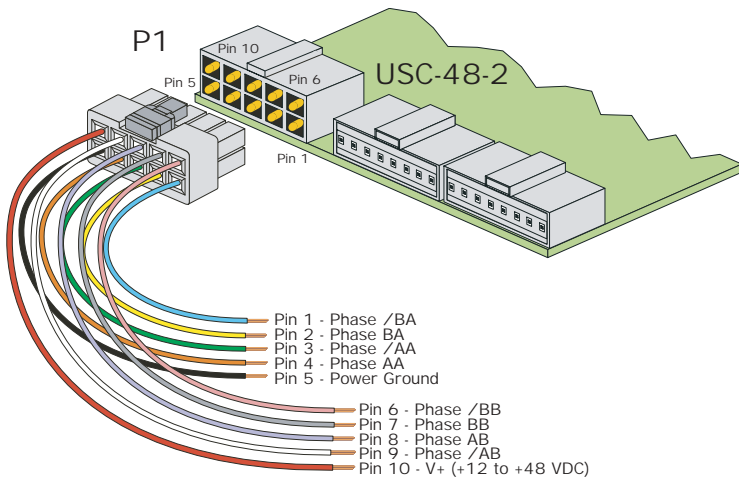
**For More Information:**  
See the complete USC-48-2 Product Manual

## Pin Assignments

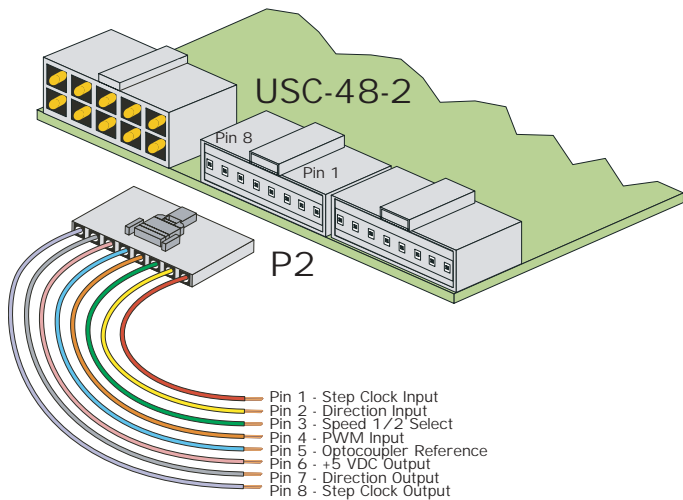
PIN#	P1	P2	P3
	Power and Motor Interface Connector	Digital I/O Connector	Analog Speed Control I/O Connector
1	PHASE /BA	SCLK IN	START/STOP
2	PHASE BA	DIR	ENABLE
3	PHASE /AA	SPEED 1/2	GND REF_ANLG IN 1
4	PHASE AA	PWM IN	+5 REF_ANLG IN 1
5	GND	OPTO REF	ANALOG IN 1
6	PHASE /BB	+5V OUT	GND REF_ANLG IN 2
7	PHASE BB	DIR OUT	+5 REF_ANLG IN 2
8	PHASE AB	SCLK OUT	ANALOG IN 2
9	PHASE /AB	--	--
10	V+	--	--

## Mating Connector Information

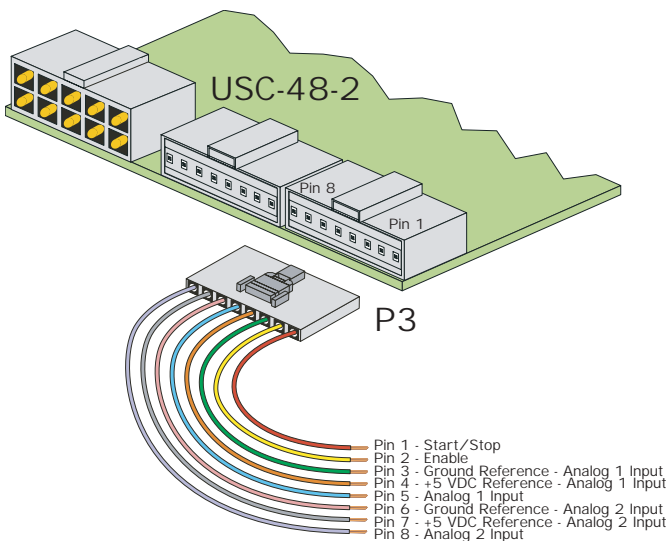
Connector:	P1	P2&P3
Manufacturer:	Molex	Tyco
Receptacle:	39012105	104257-7
Contact:	44476-111	104480-7



ADP-4210-FL Power Cable for P1 Connector



ADP-2508-FL Signal Cable for P2 Connector



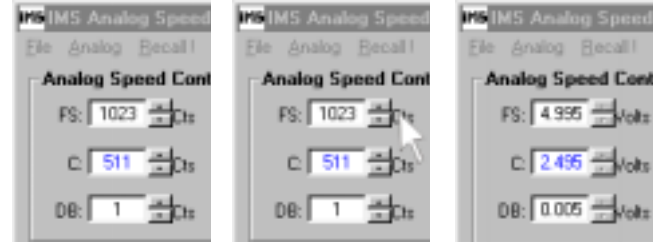
ADP-2508-FL Signal Cable for P3 Connector

## Unidirectional/Bidirectional Operation

There are two basic modes of operation: bidirectional and unidirectional. By moving the center point, both speed and direction are controlled by the IMS Speed Control Input.

In the example shown below, the Center Point of the Input Counts are set to approximately 50%. The "Counts" can be converted to "Volts" by clicking directly on the <Cts> label as shown. With a 0 to +5V input, any signal greater than 2.495V would drive the motor in one direction. Any signal less than 2.495V would drive the motor in the opposite direction.

## Bidirectional Settings



Counts set to 511 (approx 50%)

Counts can be shown as the input voltage by clicking on the <Cts> label

## Unidirectional Settings

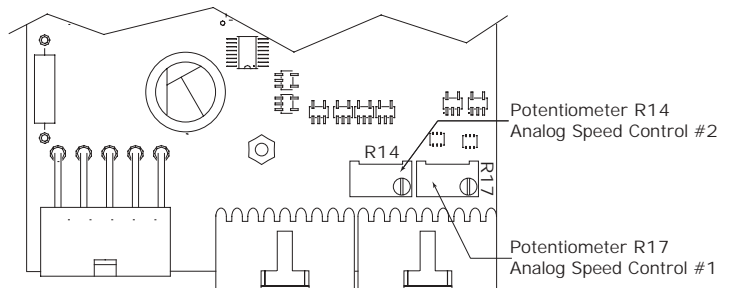
By setting the center point to zero or the lower end of the potentiometer, only velocity is controlled by the speed control input; direction is controlled by a separate digital input.



Unidirectional Settings of Counts (Volts)

## Optional Velocity Control Potentiometers

The USC-48-2 Universal Speed Control Board can be equipped with dual on-board 10kΩ potentiometers. These 15 turn potentiometers allow the user to preset the desired Analog Speed Control 1 and Analog Speed Control 2 values.



## Minimum Connections \*

