

SILVERPAK 17D/DE

MOTOR + DRIVER

MAIN FEATURES:

- Voltage: +12 to 24VDC
- Current: 0.35 to 2.0 Amps Peak, potentiometer
- Hold current: 23% or 100% of peak current, (23% default, we can set to 100% if asked)
- Step resolution: Full Step, 2x, 4x, 8x, 2 wires with 4 combinations of high and low (00, 01, 10, 11)
- Speed: (step frequency: 25 kHz)
- Inputs: Step Pulses, Direction Change, Disable/Enable driver
- Low Power Dissipation – Runs cooler than most comparable drivers.
- More efficient and provides better torque.
- Easy installation due to the integration.



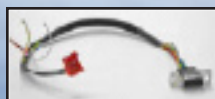
PIN ASSIGNMENTS:

A DB-9 female connector cable receives power and provides the control connections for the R208 Driver. Active signals are optically isolated. An open-collector drive is required to provide pulses for Step, levels for Direction and Disable/Enable.

Pin #	Color	Function	Input
1	Red	+V	Motor Supply Voltage: +12 to +24 VDC
2	Black	SR1 Input	Step Resolution 1. Pins 2 & 3 are used to preset the step resolution by selective contact to ground (Pin 7)
3	Brown	SR2 Input	Step Resolution 2. Pins 2 & 3 are used to preset the step resolution by selective contact to ground (Pin 7)
4	Black/White	Enable/Disable Input	This input is used to enable/disable the output of the driver.
5	Orange	Direction Input	This input is used to change the rotation direction of the motor.
6	Green	Power Ground	The ground or return of power supply connects here.
7	White	Logic Ground	Used to ground to the logic functions (i.e. step resolution)
8	Blue	Opto Supply	+5 VDC input used to supply power to the isolated logic inputs. A resistor must be used if the supply is greater than 5 VDC.
9	Yellow	Step Clock	Connects to the open-collector drive.

ACCESSORIES:

Each Silverpak 17D comes with a DB-9 connector with flying leads.



p/n 090-00019

- 090-00019 DB-9 cable (comes with unit)
- PC, function or pulse generator, controller

SILVERPAK 17DE ENCODER OPTION:

US Digital encoders can be mounted inside the Silverpak 17. E2 encoders only.

CYCLES PER REVOLUTION (CPR)		Cycles per Second	
32	400	0 to 100,000	
50	500	cycles per Revolution (CPR)	
96	512	32 to 1,250	
100	540	Pulses per Revolution (PPR)	
110	720	128 to 5,000	
120	900		
192	1000		
200	1016		
250	1024		
256	1250		
360			

(PPR) = 4x the CPR if the encoder reader reads quadrature (reads the rising and falling edge of both the A and B channels)

CHANGING STEP RESOLUTION:

Pins 2 and 3 are used to change microstepping. When one pin, both or no pins are connected to Pin 7, this will change the step resolution accordingly:

Step Resolution	SR1	SR2
Full	Close	Close
Half	Close	Open
1/4	Open	Close
1/8	Open	Open

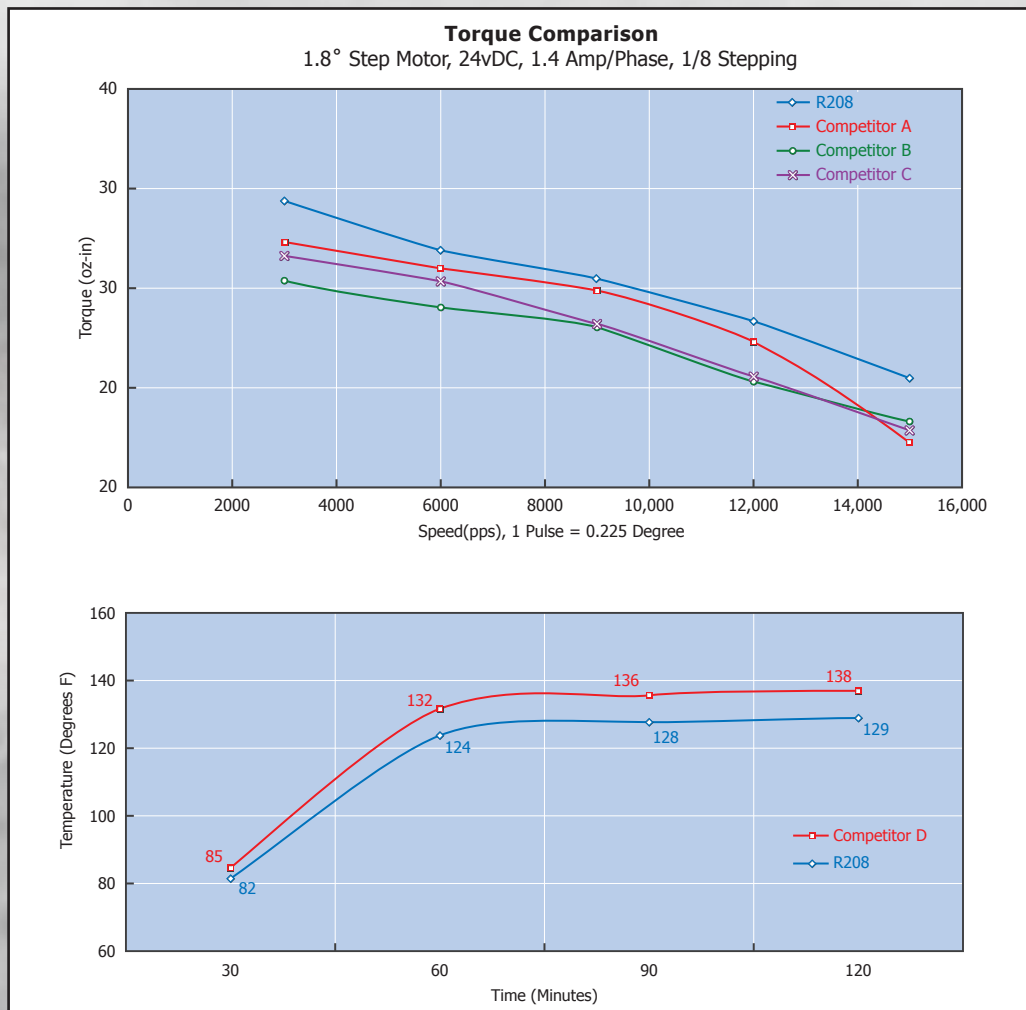
SR1 (Pin 2) and SR2 (Pin 3) are used to preset the step resolution by selective contact closure to ground (Pin 7).

KEY SELLING FEATURES:

- Extremely Low Cost
- Compact Size
- Low Power Dissipation
- Higher Torque

DETAILED FEATURES:

- Operating temperature: -20 to 50 °C
- Humidity range: 0 to 95% (non-condensing)
- Step pulse timing:
 - Minimum step pulse width: 20 microseconds (20x10⁻⁶)
 - Minimum step low time: 20 microseconds
 - Maximum power-down recovery time 20 milliseconds
- Max step frequency = 1 / [min. step pulse width + min. step low time] = 25 kHz
- More efficient and better torque output:



SILVERPARK 176/GE

MOTOR + CONTROLLER + DRIVER

MAIN FEATURES:

- Voltage: +12 to 40VDC
- Current: 0.2 to 2.0 Amps Peak, programmable in terms of percentage of max possible current
- Hold current: 0.2 to 1.0 Amps, programmable up to 50% of max possible run current
- Step resolution: 1x, 2x, 4x, 8x, 16x, 32x, 64x, 128x, 256x
- Speed: (max step frequency: 16.8MHz)
- Inputs: 2 I/O's, 1 input for homing to an opto sensor, 1 input for a switch closure to ground (Total of 2 I/O's and 2 inputs)
- RS485 communication
- Stand alone operation, can store programs on EEPROM and run upon power up
- NEW: Able to use inputs 1 & 2 as limit switches

DETAILED FEATURES:

- Operating temperature: -20 to 50°C

INCLUDED ACCESSORIES:

- 090-00022 cable for DB-9 cable comes with each unit (with a red 4-pin connector for the RS232-485 converter card)



- 090-00018 cable for motor comes with each unit (the other side is 4 flying lead wires)



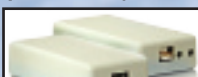
OPTIONAL ACCESSORIES:

(Available for an additional cost)

- Designer's kit: RS232-to-485 with push button, opto sensor, CD-ROM, cables (2)



- Designer's kit with USB485 converter card (USB485, push button, switch, CD, cables)



CONNECTION SPECIFICATIONS:

Pin #	Color	Function	Input
1	Red	+V (Main power in)	
2	Black	I/O	1
3	Brown	RS485B (-)	
4	Black/White	RS485A (+)	
5	Orange	Switch Closure to GND (IN)	4
6	Green	GND (-V of main power in)	
7	White	Opto Sensor Phototransistor (IN)	3
8	Blue	I/O	2
9	Yellow	Opto Sensor LED (Power Out)	

PROGRAMMING:

- Programming the R256 is simple and intuitive in HyperTerminal. Programs always begin with a forward slash "/", and address number, then one alpha character and then the value:

/1A5000R

This stands for Absolute position 5000, and will rotate 5000 steps

/1A5000A0R

This will rotate to position 5000, then back to position 0

/1gA5000A0G5R

This will rotate to position 5000, then back to 0, looping 5 times (commands between the 'g' and 'G' will be repeated, or in a loop)

/1s0gA5000A0G5R

By typing 's0', this means to store the following commands in the EEPROM and run this program upon power up.

SILVERPAK 23C

MOTOR + CONTROLLER + Driver

MAIN FEATURES:

- Voltage: +12 to 40VDC
- Current: 0.2 to 3.0 Amps Peak, programmable in terms of percentage of max possible current
- Hold current: 0.2 to 1.5 Amps, programmable up to 50% of max possible run current
- Step resolution: 2x, 4x, 8x, 16x, 32x, 64x, 128x, 256x (NO FULL STEPPING)
- Speed: (max step frequency: 16.8kHz)
- Inputs: 4 user configurable analog or digital inputs (limited analog capabilities)
- Outputs: 2 outputs capable of driving 1 Amp of current
- RS485 communication
- Stand alone operation, can store programs on EEPROM and run upon power up

DETAILED FEATURES:

- Operating temperature: -20 to 50°C

INCLUDED ACCESSORIES:

- A DB-15 cable comes with each unit and it depends on which converter card they are using.



OPTIONAL ACCESSORIES:

(Available for an additional cost)

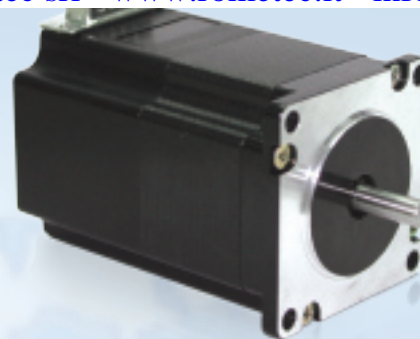
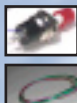
(p/n 083-00035)

- Designer's kit: RS232-to-485, push button, opto sensor, DB-15 cable (p/n 090-00094), and CD-ROM



(p/n 083-00036)

- Designer's kit: USB485 converter card, push button, opto sensor, DB-15 cable (p/n 090-00096), 6 ft USB cable, 3-pin to 3-pin cable and CD-ROM



CONNECTION SPECIFICATIONS:

Pin #	Color	Function	Input
1	Green	Power Input GROUND	
2	Black	1A On/Off Driver OC Pulldown	
3	White/Green	Opto Isolated Step Input (driver only)	
4	Yellow	Opto Isolated +5 VE Power Input (driver only)	
5	Orange	Input	2
6	Yellow/White	Opto Sensor LED	
7	Orange/White	Input	
8	Black/White	RS485 A	3
9	Red	12V to 40VDC Input POWER	
10	Blue	1A On/Off driver OC Pulldown	
11	Blue/White	Opto Isolated Direction Input (driver only)	
12	Green/White	Signal Ground	
13	White	Input	1
14	Red/White	Input	4
15	Brown	RS485 B	

OPTIONS:

- Silverpak 23CE – Encoder Option: US Digital encoders can be mounted inside the Silverpak 23C. E2 Encoders only.

Cycles per Second	Cycles Per Revolution (CPR)	
0 to 100,000	32	400
Cycles per Revolution (CPR)	50	500
32 to 1,250	96	512
Pulses Per Revolutions (PPR)	100	540
128 to 5,000	110	720
	120	900
	192	1000
	200	1016
	250	1024
	256	1250
	360	

The Silverpak 23C has encoder feedback where it constantly checks the position register on board compared to the encoder position register. Any time this is off, it will correct

- Can run a program stand alone (no PC needed)
- Simple programming
- Encoder feedback with position correction
- Two designer's kits available for the RS232 or USB user

KITS:		CARD ONLY (no-kit)
083-00004 Designer's Kit for RS232	RS485, push button, opto sensor, cables	017-00004 RS232-485 converter card
083-00026 Designer's Kit for USB	USB485, push button, opto sensor, cables	USB485 converter card

*High resolution encoder adder (>1000)

COMMON TECH SUPPORT QUESTIONS / RMA ISSUES:

• MOTORS ARE HOT:

Check holding current or running current. It could be too high.

• POWER SUPPLY IS DRAWING EXCESSIVE CURRENT:

Ensure polarity is not switched on the main power supply, or on the converter card if using the RS232 to RS485 converter.

• MOTOR ROTATES, BUT IRRATICALLY, NOT SMOOTHLY:

If one of the two drivers are blown, then only half of the driver works. If this is the case, turning on and off the pulses to move and stop the motor might cause the motor to rotate CW and CCW at random times, when it should only rotate in one direction. Also, only half the torque is available.

Acceleration or speed is too fast for the motor. Lower the speed until it steps smoothly

You could be hitting a resonant spot, microstep the unit to see smoother results

• I CANNOT TYPE ANYTHING IN HYPERTERMINAL:

Check to make sure that you have the correct COM Port selected. Are you using Windows 95? Windows 95 has had problems with its HyperTerminal. Use an operating system of Windows 98 or higher.

Are you working on a Laptop? Sometimes there is a shift in Ground on Laptop Serial Ports. Pin 5 on the Serial Port is Ground. Confirm that this is connected to a true ground.

Did you check the Properties in HyperTerminal? Go to File / Properties / Settings / ASCII Setup, and check the box 'Echo Typed Characters Locally'.

Is the LED flashing on the back of the unit (heatsink side)? A flashing light indicates it is waiting for Commands. The other steady LED indicates that Power is being supplied to it. If neither of these is on, then check your Power Supply.

Check the Converter Card. Use a voltmeter to measure if Power is coming into the card correctly and if power is being supplied to the Controller properly.

• I AM ABLE TO TYPE IN HYPERTERMINAL BUT NOTHING HAPPENS:

Check the LED's. If neither is on, check the Power Supply. If one is steady, and the other is flashing, then Power is OK.

Is the unit set to the correct Address? Check the Red Dial on the back of the unit. The white arrow should be pointing to the corresponding Address. Confirm that the arrow is not between 2 Addresses.

Check the Converter Card. Use a voltmeter to measure if Power is coming into the card correctly and if power is being supplied to the Controller.

Assuming the Properties of HyperTerminal are set as described in the Manual (Getting Started), does HyperTerminal respond with a string of characters?

/O' indicates that the command is terminated

/O@ indicates that the command was received correctly

/OC indicates that the command is out of range

/Ob indicates bad command

Check the COM Port settings on 'My Computer'. Right-click on My Computer and go to Properties / Hardware / Device Manager / Ports. Be sure you have the correct COM# set in your HyperTerminal settings.

• MOTOR STALLS IN THE MIDDLE OF A COMMAND:

This means there is not enough current being supplied to the Motor. Use the m and l (lower case L) commands to change