

Description:

The GSM4, together with the optional PSU4 power supply, provides a comprehensive facility for controlling 4 or 8 wire Bipolar driven stepper motors. Up to 4 GSM4 cards can be daisy-chained to control up to 4 motors. Simple software commands can be sent from a PC via the RS232 serial port to the GSM4 to control motor direction, number of steps, start and stop ramp length and slope, motor current and 1/2 / full step. All commands carry address information.

On board settings include card address (0, 1, 2, 3) motor current (set to suit motor specification) and number of steps / second (speed).

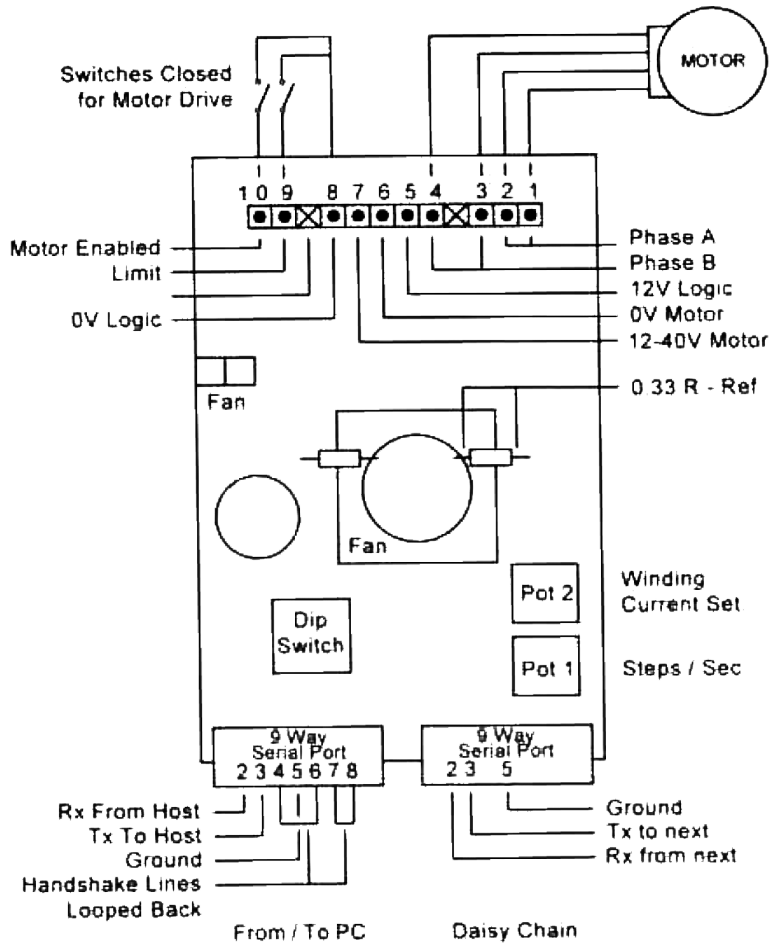
Specifications:

Supply Voltage Max	: 240V AC
Output Voltage Max	: 40V DC
Output Voltage Min	: 12V DC
Output Current	: 800mA
External Depth	: 150mm
External Length / Height	: 35mm
External Width	: 100mm
For Use With	: Motor and Controller Testing
Mounting Type	: Chassis
Output Current Max	: 1.5A
Supply Voltage	: 250V
Motor Drive	: 4 or 8 wire bipolar current switching

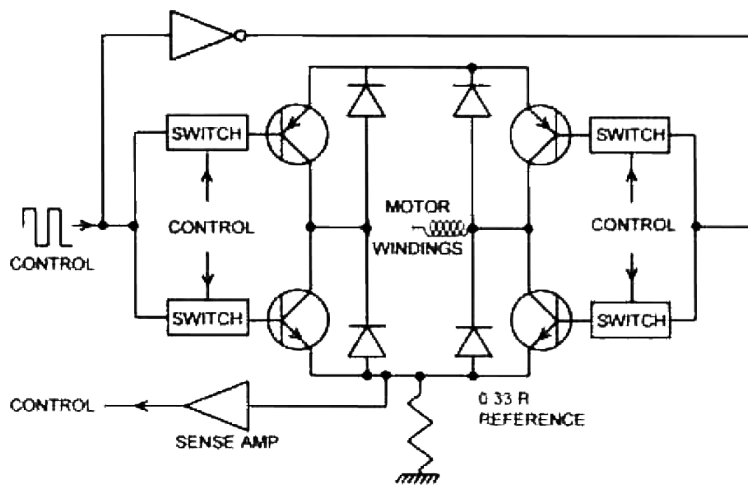
Stepper Motor Drive



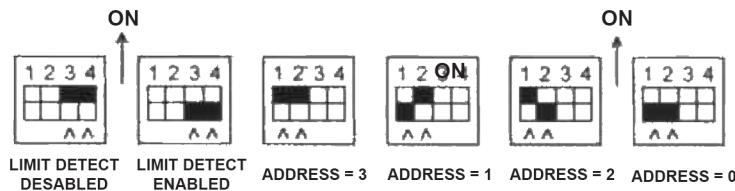
Board Layout



Motor Drive Schematic (One Phase)



Switch Settings

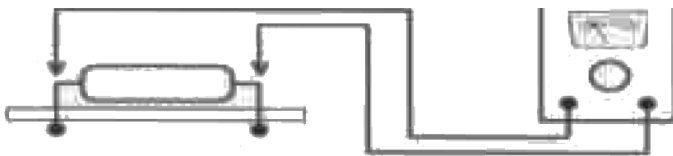


GSM4 - ON Board Settings

POT 1. Pot 1 adjusts the speed of the motor in steps / second. This pot should only be adjusted as required during the setting up stage of the process to give the required motor speed.

POT 2. Pot 2 is adjusted to provide the required winding current for the motor. It is advisable to start with the pot at minimum (fully clockwise) and increase slowly until motor current is sufficient to drive the motor. To adjust the current connect a voltmeter across either OR33 resistor. Set meter to 2 Volts F.S.D. or nearest range. Adjust POT 2 for required reading of voltmeter where 1mV = 3 mA winding current.

Motor Current Adjustment



For example if the motor winding recommended current is 1.5A then the pot 2 should be adjusted to read 500mV. Warning ! Under no circumstances connect a meter set to Ohms Range, or any other voltage source, across R ref., as this will destroy the motor drive controller. Limit and motor enable switches may be connected to the GSM4. If the motor enable switch is NOT used the appropriate terminal on the GSM4 must be linked to OV logic.

Serial Port Setup (COM 1)

9,600 Baud

8 Bits

No Parity

1 Stop Bit

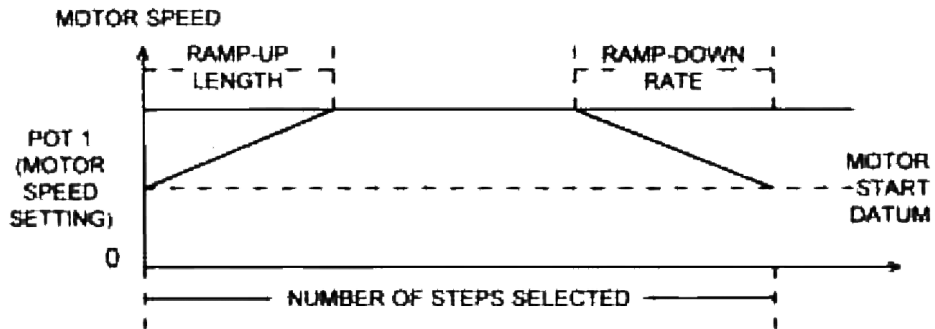
Default Settings

On power up the GSM4 sets to the following default settings.

Full step mode. - 100% motor current option OFF.

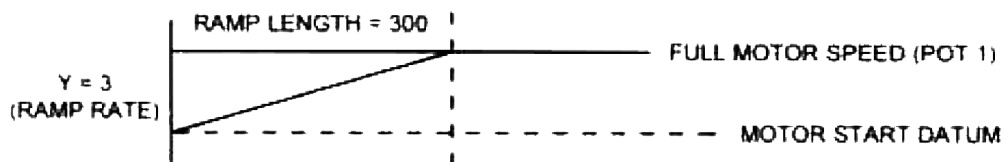
No Ramp. - Motor current ON when stopped. Current boost for ramp OFF.

RAMPS



$$\text{MOTOR START DATUM SPEED} = \frac{\text{MOTOR MAXIMUM SPEED} \times 48}{48 + \left(\frac{\text{RAMP LENGTH}}{\text{RAMP RATE}} \right)}$$

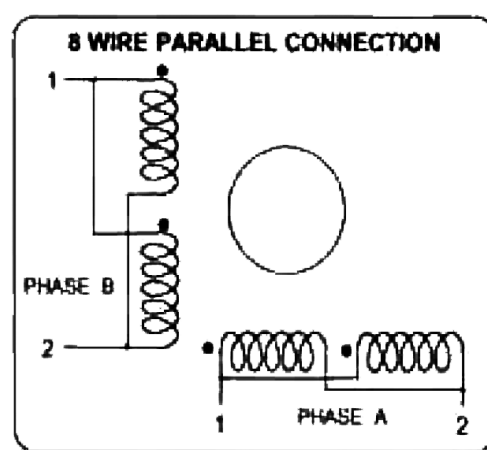
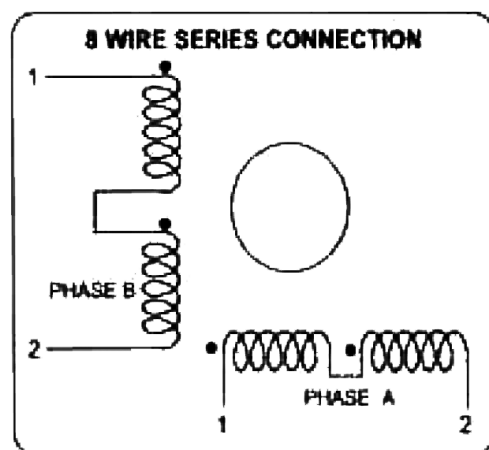
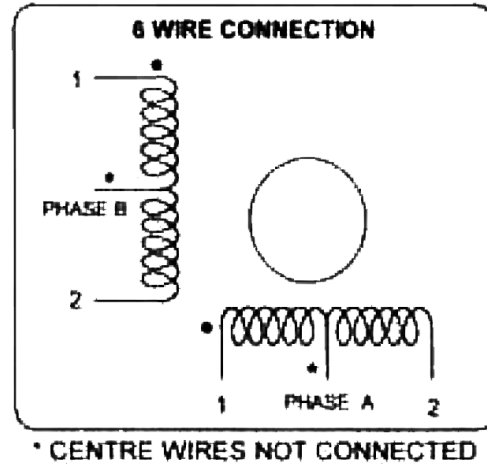
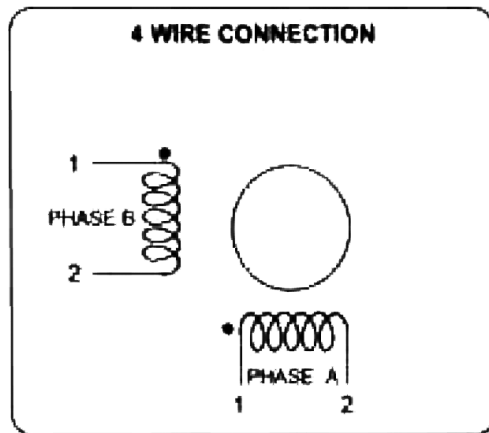
* If the slope of 0 is specified then Ramp Rate = 256 otherwise the rate is as programmed by the F command.



$$\text{MOTOR START DATUM SPEED} = \frac{\text{MOTOR MAX. SPEED (POT 1 SETTING)} \times 48}{48 + \left(\frac{\text{RAMP LENGTH}}{\text{RAMP RATE}} \right)}$$

For the example above, if motor speed set at 400 half steps / second,

$$\text{MOTOR START DATUM SPEED} = \frac{400 \times 48}{48 + \frac{300}{3}} = \frac{19200}{148} = 130 \text{ Half Steps / Sec}$$



NOTES:

- 1/. The GSM4 is not suitable for 5 wire motors.
- 2/. Reversing the wires of any one phase will reverse the direction the motor rotates in response to commands.
- 3/. 8 Wire parallel connections give higher rotational speed.
- 4/. 8 wire series connections provide higher motor torque.
- 5/. Always refer to the motor manufacturers data.

General Notes

- 1/. The stepper motor chosen for use with the GSM4 must be fully compatible with Bipolar drivers.
- 2/. Motor torque is motor current and motor speed related. Torque is proportional to current and inversely proportional to speed.
- 3/. The effective motor impedance is proportional to the load and the speed of the motor.
- 4/. The GSM4 will supply sufficient current for motors specified at 1.5 Amp / winding. Motors with higher current requirements can be driven but they will not run at full power.
- 5/. If motor enable switch is not used the appropriate connector must be linked to 0 Volt Logic.
- 6/. Ramps are used to provide increased starting torque and to overcome motor resonance.
- 7/. Current boost is dependent upon the setting of Pot 2 and is available for the length of the ramp only.
- 8/. When adjusting Pot 2 it is recommended that the initial winding current is set at less than the value recommended for the motor and that the motor is driven at this current whilst the motor temperature is monitored. Avoid running the motor at high temperatures. (See motor manufacturers specification).
- 9/. Stepper motor drivers generate large amounts of RFI and should be enclosed in an adequately screened enclosure, having good ventilation.
- 10/. The GSM4 must be connected to a serial port in order to control the GSM4 and motor.
- 11/. Pins 4 & 6, 7 & 8 on the serial port to the PC are linked on the PCB to terminate handshakes.

Part Number Table

Description	Part Number
Drive, Stepper Motor, 1.5A	GSM4+PSU2

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