

PLG-101

Stepping Motor Drive Oscillator

Operation Instructions

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General Description:

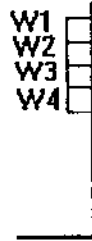
The PLG-101 is a Stepping Motor Drive Oscillator used to produce basic machine/system movements that do not require a great amount of precision. Using the Trigger mode you can start the PLG with a contact closure between the Trig-Start Input (Active Low) and Ground. In this mode a Pulse train output will first be produced at a frequency determined by the setting of the Start/Stop Speed (W4). Following the Start/Stop Speed there will be an Acceleration which is determined by the setting of the Acceleration/Deceleration Rate(W3) until the final Speed (max. freq.), which is determined by the setting of the Trigger/Level Speed (W1). Once the Trigger mode is in operation then the Pulse train output can be stopped with the Trig-Stop Input (Active low) where a deceleration will take place or the Lev-Stop Input (Active low) which can be used as a quick stop. However, the Lev-Stop Input must be held low for the same duration as the deceleration rate. Using the Level mode is similar to the Trigger mode however, in this mode of operation a Pulse train output will only be produced as long as the Lev-Start Input (Active low) is in contact with ground. In order to stop the Level mode you must either remove the Lev-Start's Input contact with ground which will produce a deceleration rate or apply an active low input to the Lev-Stop Input which will produce a quick stop as mentioned above. The Scan mode is similar to the Level mode however for this mode of operation you can run a system at a different frequency/speed from that of the Trigger & Level modes. If the Scan mode is used it will have priority over the Level and Trigger modes therefore you may use the PLG -101 when a slow or faster speed is required within a particular moving profile.

Features:

- * Two adjustable speeds: Trigger/Level speed & Scan speed.
- * Adjustable Start/Stop speed.
- * Adjustable Acceleration/Deceleration Rate.
- * Switchable Analog Input
- * Pulse and Direction outputs
(Opto-Isolated: 20 mA maximum sink current)
- * Level Start, Trigger Start, and Scan Start inputs
(Opto-Isolated: 12 mA maximum sink current)
- * Level Stop and Trigger Stop inputs.
(Opto-Isolated: 12 mA maximum sink current)
- * Single power supply (8 ~ 24 VDC)
- * Dimensions: Length 3" x width 3" x height 1"
- * Operation Temperature: 0°C ~ 50°C
- * Storage Temperature: -40°C ~ 120°C

Potentiometer Settings:

Note: All of the following potentiometer adjustments are in reference to the right side of the circuit board with potentiometer W1 near the top .



Trigger/Level Speed (W1):

The maximum frequency (speed) of the Trigger Start & Level Start modes is determined by the setting of the ,10-Turn , potentiometer W1. Turning this potentiometer **clockwise** will **increase** the maximum frequency(speed) for these modes. Turning the potentiometer **counterclockwise** will **decrease** the maximum frequency(speed) for these modes. The maximum frequency obtainable is 10 KHz.

Scan Speed(W2):

The maximum frequency (speed) of the Scan mode is determined by the setting of the , 10-Turn , potentiometer W2. Turning this potentiometer **clockwise** will **increase** the maximum frequency (speed) for this mode. Turning the potentiometer **counterclockwise** will **decrease** the maximum frequency (speed) for the Scan mode. The maximum frequency obtainable is 10 KHz.

Acceleration/Deceleration Rate (W3):

The acceleration/deceleration rate is determined by the setting of the, 10-Turn, potentiometer W3. Turning the potentiometer **counterclockwise** will **decrease** the acceleration/deceleration rate . Turning the potentiometer **clockwise** will **increase** the acceleration/deceleration rate.

Start/Stop Speed(W4):

The start/stop frequency (speed) is determined by the setting of the, 10-Turn, potentiometer W4. Turning the potentiometer **counterclockwise** will **decrease** the start/stop frequency (speed). Turning the potentiometer **clockwise** will **increase** the start/stop frequency (speed).

Note: The setting of the Start/Stop Speed should never be adjusted fully counterclockwise, doing so may produce unpredictable results. In addition, the Start/Stop speed should never be set to the same level as , or a higher level than, the Trigger/Level or Scan Speeds because this condition will cause neither of these modes to operate. If it is desired to have the Start/Stop speed almost equal to the Maximum Speed then it would be better to adjust the Start/Stop Speed slightly below the Maximum Frequencies of the Trigger/Level & Scan Speed , then increase the acceleration rate to its fully clockwise setting.

Jumper Settings:

JP1: When pin 2 & pin 3 of the jumper JP1 are connected, the Motor speed (Pulse Rate) is controlled by potentiometer W1. When pin 1 & pin 2 of the Jumper JP1 are connected, the Analog Input is enabled. In this mode, an Analog signal connected to pin 7 will control the output frequency from the start/stop frequency to the maximum frequency. This signal should range from 0 VDC to the voltage supply minus 4 VDC.

Example: If your voltage supply is 24VDC, the range will be from:
0VDC to 20VDC (24-4)

JP2: The jumper JP2 must connect pins 1 & 2 at all times

Connector Pin Assignment:

Pin#	Name	Descriptions
1	TRG_STOP	Edge Triggered Stop Input: A contact closure between this pin and the GND pin stops the pulse train output which was initialized by TRG_START input. It will not stop the pulse train output if LEV_START is active. <u>Deceleration</u> will take place and the motor will stop when the speed decreases to the start/stop speed.
2	TRG_START	Edge Triggered Start Input: A contact closure between this pin and the GND pin starts the output pulse train <u>with acceleration</u> . It may be stopped by either of the two stop inputs: Trg_stop or Lev_stop.
3	LEV_START	Level Start Input: A contact closure between this pin and the GND pin will start the output pulse train <u>with acceleration</u> . The pulse train will run as long as this input is active (LOW). When the contact is opened, <u>deceleration</u> will take place and the motor will stop at the start/stop speed. This input can only be stopped by the LEV_STOP input or by opening the contact. If the LEV_STOP is used, the motor will stop without decelerating to the start/stop speed.
4	SCAN	START SCAN MOVE Input: A contact closure between this pin and the GND pin starts the output pulse train <u>with acceleration</u> . The output pulse frequency will increase until the scan frequency is achieved. When released, deceleration will take place and will stop at the start/stop frequency.
5	LEV_STOP	Level Stop Input: A contact closure between this pin and the GND pin will stop the pulse train output initialized by SCAN, TRG_START or LEV_START inputs <u>without deceleration</u> . If it is used to stop SCAN or LEV_START inputs, the pulse train output will resume once the LEV_STOP input is released.
6	DIR_IN	Direction Input: The motor will rotate in one direction when this pin is open and will rotate in the other direction when this pin contacts with the GND pin.
7	VOL_IN	Analog input (0 ~ Vin - 4): If pin 1 & pin 2 of jumper 2 are connected, the Analog Input is enabled and the output pulse train frequency is proportional to the input voltage.
8	PULSE	Pulse train output terminal (open collector output, SN74S08, Max20 mA)
9	DIR	Direction output terminal (open collector output, SN74S08, Max 20 mA)
10	+ 5V	+5 VDC output terminal (Max 200mA)
11	GND	Ground (Power Input Common)
12	GND	Ground (Power Input Common)
13	Power In	Power input: 8 - 24 VDC power input terminal.

General Setup Instructions:

Begin by connecting your motor / driver system to the PLG-101 as illustrated on the attached wiring diagram. Be aware that the motor may begin running when power is connected to the PLG-101, so be sure that the motor shaft is not connected to anything until the initial setup is complete. Next, connect your stepping motor, driver and PLG-101 to their respective power supplies but do not apply power yet.

Next, check the jumper connections of JP1 and JP2. For the proper jumper settings, see the section describing jumper settings .

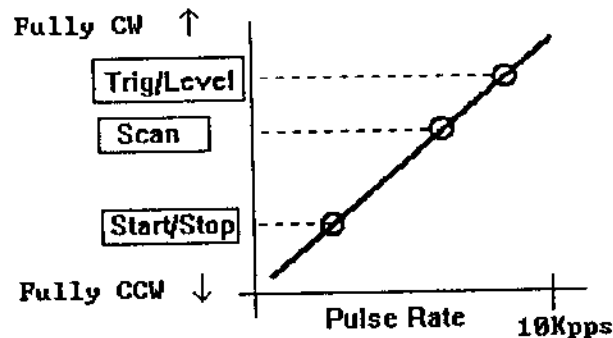
The next step is to reduce the maximum speeds for the Trigger/Level Speed and Scan Speed modes. Turn the potentiometer W1 (Trigger/Level Speed) counterclockwise until you reach the limit (you may hear a click) . Then turn it five (5) revolutions clockwise, this will set the maximum speed to a safe level, about 1500 pps. Repeat this procedure for potentiometer W2 (Scan Speed).

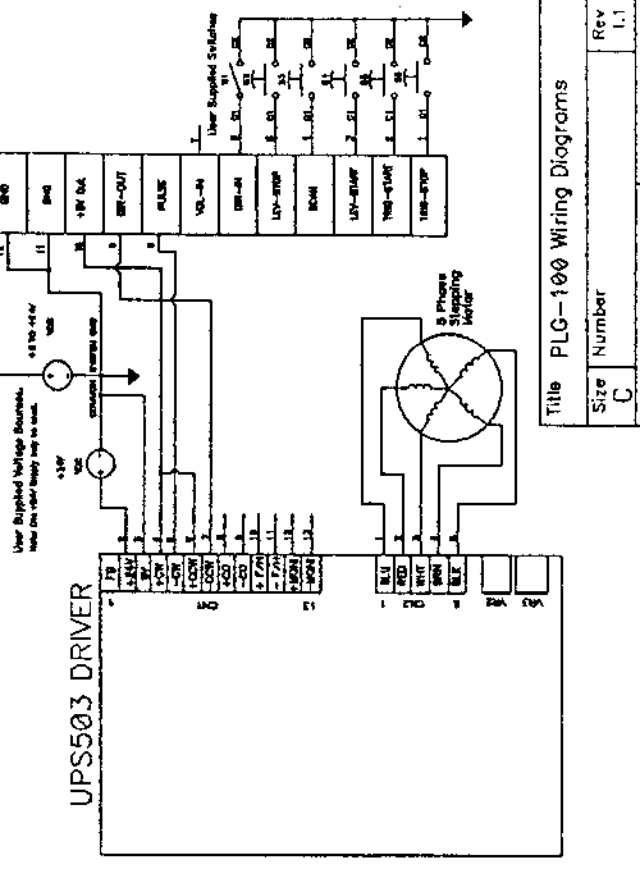
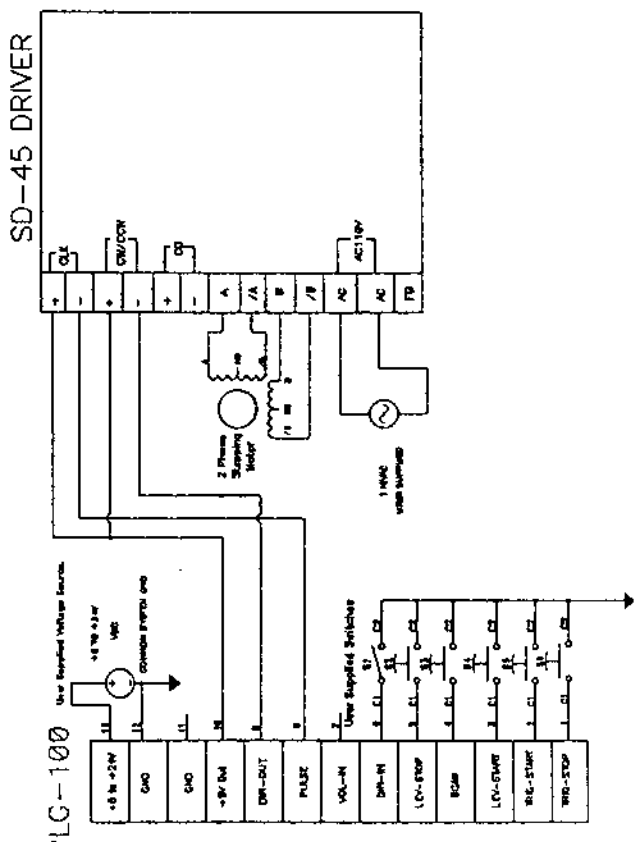
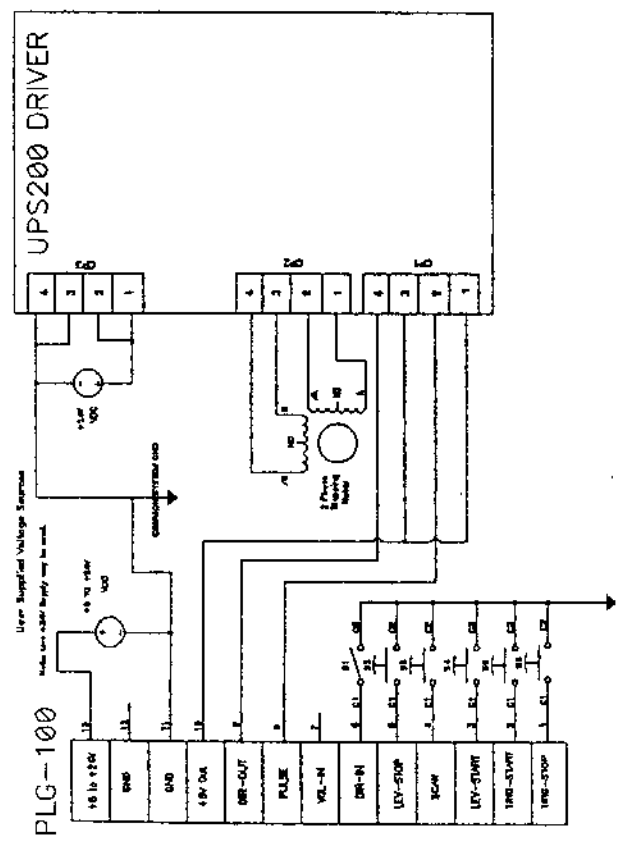
The next step of the process is to set the Start/Stop Speed. Turn the potentiometer W4 (Start/Stop Speed) counterclockwise until you reach the limit (you may hear a click). Then turn the potentiometer 1 or 2 turns clockwise. This should set the Start/Stop speed to a lower value than the maximum speeds of the Trigger/Level & Scan speeds.

Now with power applied, be certain that the motor shaft is not connected to anything, activate the Level-Start or the Scan input with a contact closure between this pin and ground (Power Common). Then adjust W4 ,counterclockwise to decrease the speed and clockwise to increase the speed, until you see the motor shaft rotating slowly.

Note: The setting of the Start/Stop Speed should never be adjusted fully counterclockwise, doing so may produce unpredictable results. In addition, the Start/Stop speed should never be set to the same level as, or higher than , the Trigger/Level or Scan Speeds because this condition will cause neither of these modes to operate. If it is desired to have the Start/Stop speed almost equal to the maximum frequencies of the Trigger/Level & Scan Speed, then it would be better to adjust the Start/Stop speed slightly below these speeds , then increase the acceleration rate to its fully clockwise setting.

Now that the basic parameters of the PLG have been established, the final speeds, accelerations and start/stop speeds can be fine tuned for your specific hardware and application





Title		PLG-100 Wiring Diagrams	
Size	Number	Rev	1.1
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Date	28 August 1994	Sheet	1 of 1
File name	PLG1-8.501		F