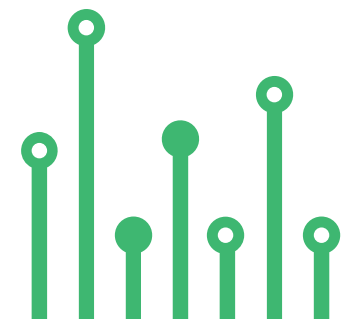


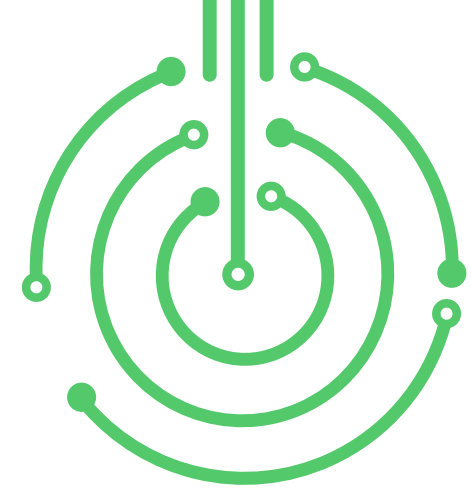
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Programmable Step-Direction Pulse Generator for Stepper, BLDC and AC Servo Motor Drivers



SKU: EL137578

Programmable Step-Direction Pulse Generator for Stepper, BLDC and AC Servo Motor Drivers

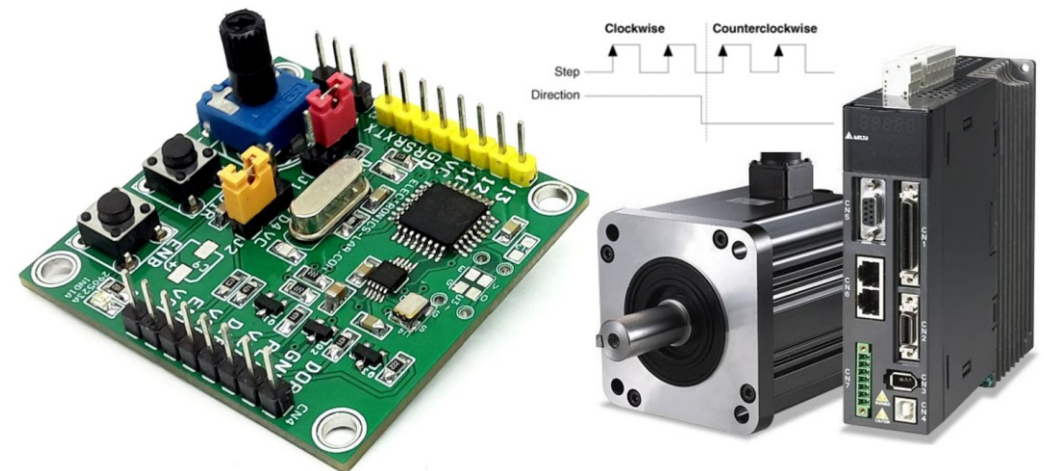


A programmable pulse generator is a very useful tool for stepper, BLDC, and AC servo drivers. Various stepper and servo drivers work with step and direction inputs. This project is the right solution to drive such drivers since it can provide a high-frequency output which is important for most AC servo drivers. The project provides a jitter-free high-frequency pulse, direction, and enable signal. The output frequency can be configured up to 12 MHz since the project is Arduino-compatible. All outputs are open collector types (5V). 2 x tactile switches are provided to set the direction and enable. An onboard trimmer potentiometer is provided to adjust the step frequency.

The project is Arduino compatible and consists, of an ATMEGA328 micro-controller, AD9833 DDS chip, tactile switches, and onboard trimmer pot. On-board connector provided for boot-loader and Arduino programming connector. 2 x Jumpers are connected to D3 and D4 pins of ATMEGA328. DDS chip can output high frequency up to 12Mhz.

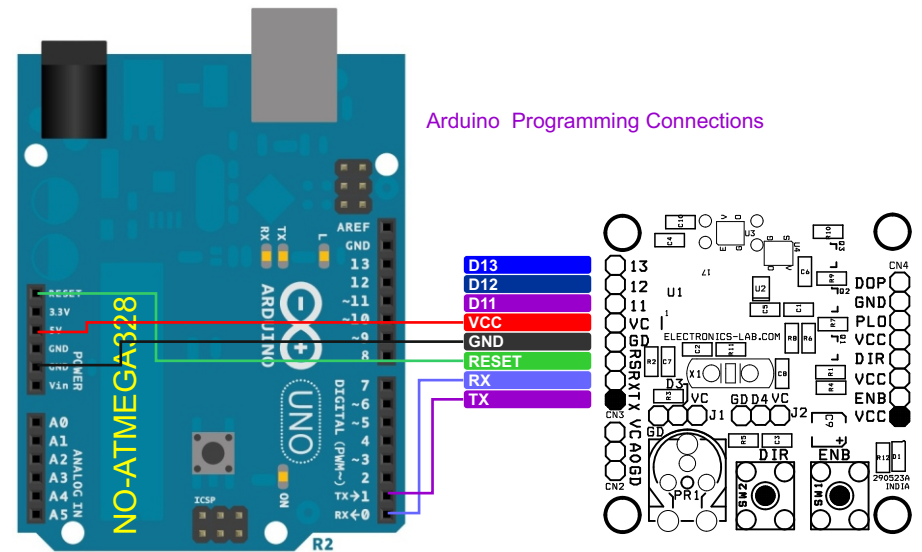
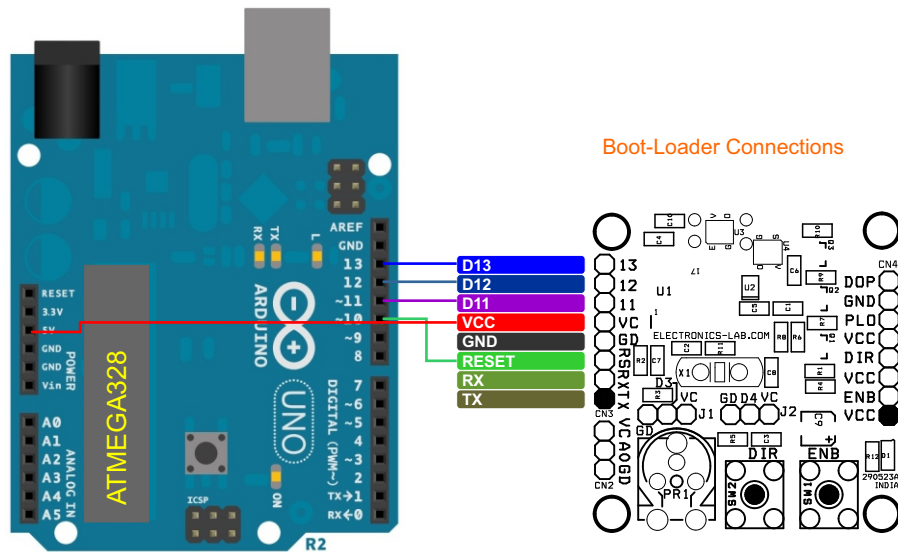
Features

- Supply 5V DC
- Current Consumption 30mA
- Output Frequency 200Khz (Range Up to 12Mhz) – Open Collector
- Pulse, Enable, Direction Outputs are Open Connector TTL Type
- Direct Output from AD9833 Square wave TTL, (Triangular Wave, Sine wave = 0.6V)
- On Board Enable Switch
- On Board Direction Switch
- On Board Power LED
- On Board Trimmer Potentiometer to Adjust the Frequency
- Jumpers to select the Triangular Wave, Sine Wave, Square Wave, Half Square Wave
- Optional Components for Hardware Acceleration/Deacceleration (Resistor R5, and Capacitor C9)
- PCB Dimensions 43.34 x 41.43 mm
- 4 x 3MM Mounting Holes



ARDUINO CODE

The Arduino code is available as a download below. Burn the bootloader and upload the code. The default output is 200Khz with this example code. The output frequency can be changed in Arduino code.



FREQUENCY GENERATOR

The board also can be used as a frequency generator. Jumpers J1 and J2 are provided to select the pulse type output. Use pin 8 of CN4 for direct output. Square output is TTL 5V, but tringle and sinewave output is lower.

PULSE FREQUENCY

The default frequency output is 200Khz, this can be increased or decreased in Arduino code as per requirements. AD9833 supports frequencies up to 12Mhz. The output frequency is depended on the stepper driver micro-stepping setup and drive requirement; it is important to configure the required frequency in Arduino code.

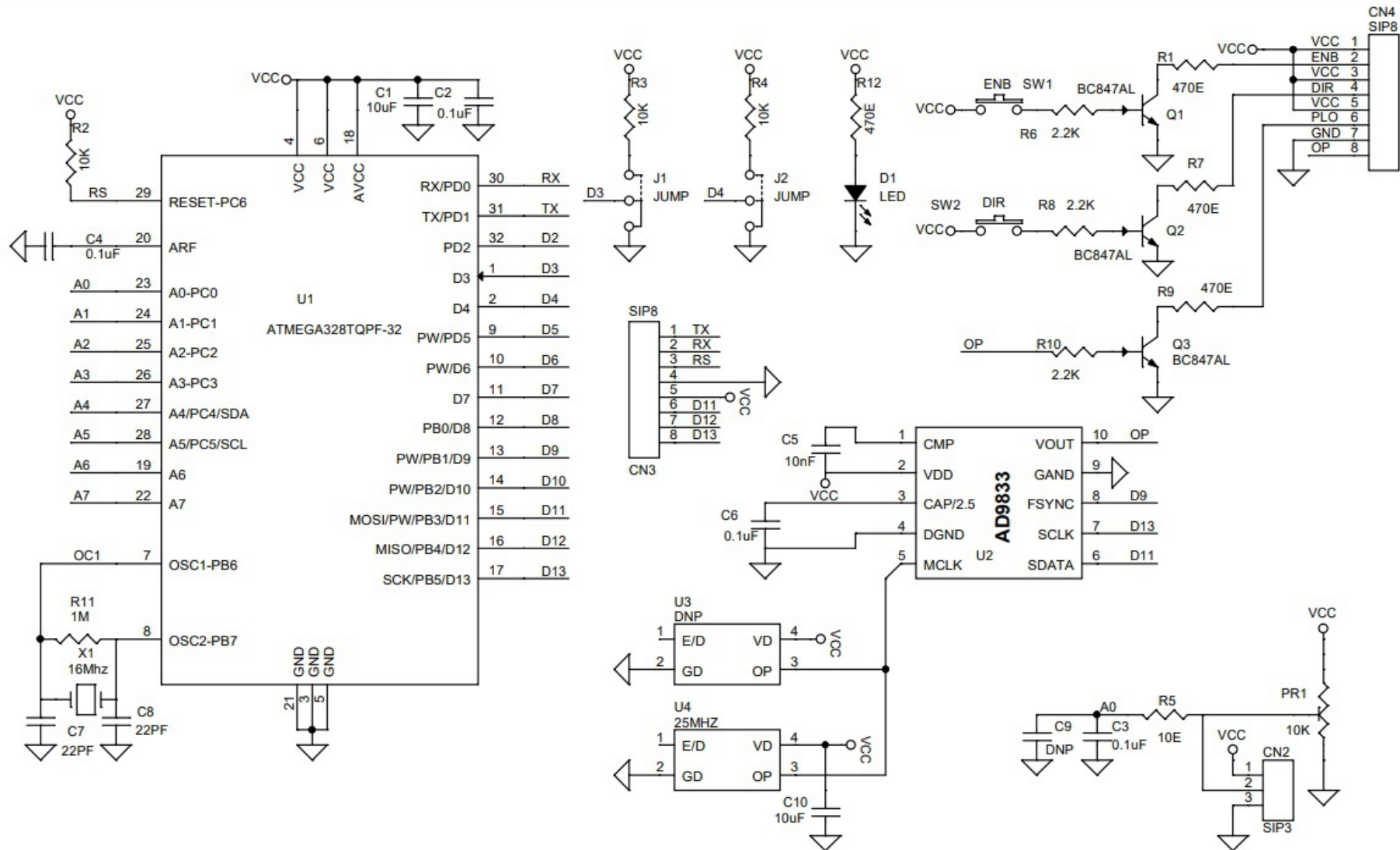
RAMP

Example code doesn't have the option to adjust the Acceleration and Deceleration. Users may include this in Arduino code. Little acceleration can be achieved with hardware changes. Install R5 10K to 100K, Install Capacitor C9 electrolytic value between 10uF to 33uF to include hardware acceleration.

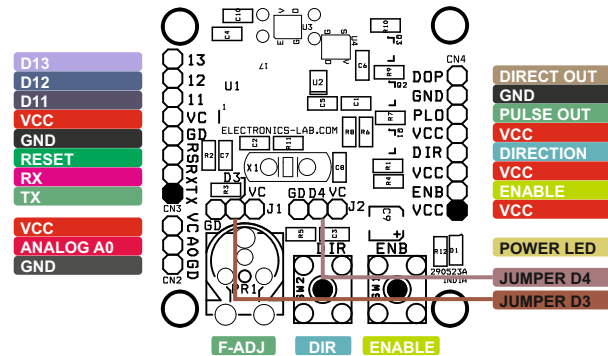
OUTPUTS

Step Pulse, Direction, and enable outputs are open collector type and TTL compatible, Direct Output of AD9833 (CN4 pin 8) is TTL for square wave and 0.6V Sinewave and Triangular Wave.

Schematic



Connections



Connections and Other Details

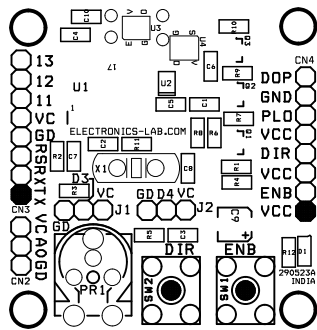
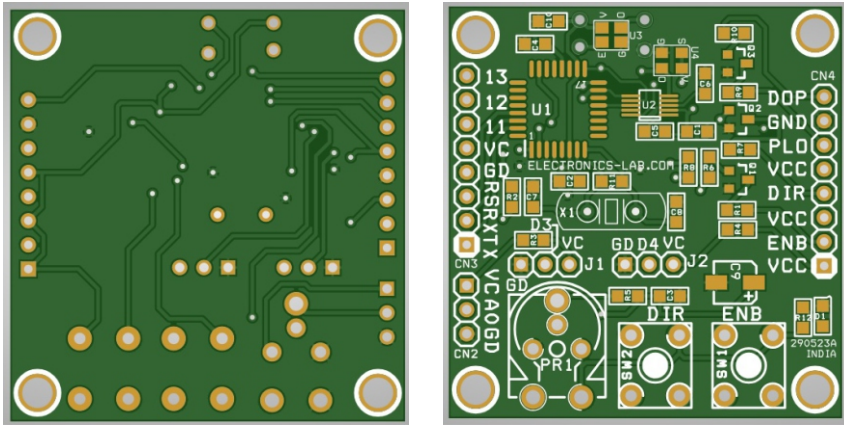
- CN1: Not Configured
- CN2: External Analog Input/External Potentiometer (In this case don't install PR1)
- CN3: Programming/Boot-Loader Pin 1 = TX, Pin 2 = RX, Pin 3 = Reset, Pin 4 = GND, Pin 5 = VCC, Pin 6 = D11, Pin 7 = D12, Pin 8 = D13
- CN4: Pin 1 = VCC, Pin 2 = Enable, Pin 3 = VCC, Pin 4 = Direction, Pin 5 = VCC, Pin 6 = Pulse Output, Pin 7 = GND, Pin 8 = Direct Pulse Output
- J1 and J2: Signal Output Selection / Optional Jumpers for Various Application
- SW1: Enable
- SW2: Direction
- D1: Power LED

Arduino Pins: Digital Pin D3 and D4 Jumper J1 and J2, D9 = AD9833 FYNC, D11 = AD9833 SDATA, D13 = AD9833 SCLK

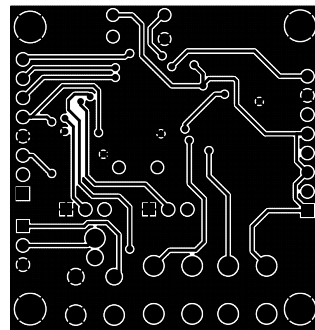
Frequency Generator Jumper Settings

- J1-D3 = 0(Low) , J2-D4 = 0 (Low) >> Sine Wave
- J1-D3 = 0(Low) , J2-D4 = 1 (High) >> Triangular Wave
- J1-D3 = 1(High) , J2-D4 = 0 (Low) >> Square Wave
- J1-D3 = 1(High) , J2-D4 = 1 (High) >> Half Square Wave

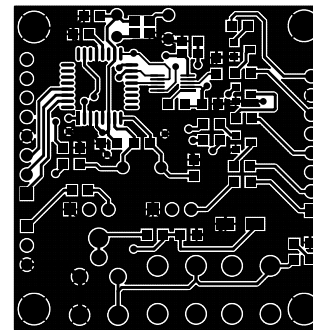
PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 43.34 X 41.43MM

Parts List

BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER'S PART NO
1	1	CN2	3 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
2	2	CN3,CN4	8 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5321-ND
3	2	C1,C10	10uF/10V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	4	C2,C3,C4,C6	0.1uF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
5	1	C5	10nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	2	C7,C8	22PF/50V CERAMIC MSD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	2	U3,C9	DNP			
8	1	D1	LED RED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
9	2	J1,J2	2 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5315-ND
10	3	R2,R3,R4	10K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
11	3	Q1,Q2,Q3	BC847AL SOT23	DIODE INC	DIGIKEY	BC847BT-FDICT-ND
12	4	R1,R7,R9,R12	470E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	R5	10E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	3	R6,R8,R10	2.2K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
15	1	R11	1M 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
16	1	SW1	TACTILE SWITCH 4 PIN	NKK SWITCH	DIGIKEY	HP0215AFKP2-ND
17	1	SW2	TACTILE SWITCH 4 PIN	NKK SWITCH	DIGIKEY	HP0215AFKP2-ND
18	1	U1	ATMEGA328TQPF-32	MICROCHIP	DIGIKEY	ATMEGA328PB-AURCT-ND
19	1	U2	AD9833	ANALOG DEVICE	DIGIKEY	505-AD9833BRMZ-REEL7CT-ND
20	1	U4	25MHZ/3.2X2MM OSCILATOR 5V	ALIEXPRES	DIGIKEY	ALIEXPRESS
21	1	X1	16Mhz	ECS INC	DIGIKEY	X1103-ND
22	1	PR1	10K TRIMMER POT	PIHER	DIGIKEY	1993-1104-ND
23	2	J1,J2	SHUNT	SULLINS CONCT	DIGIKEY	S9001-ND

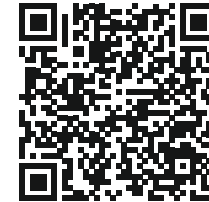
Notes



APP

Android App

DOWNLOAD



Android App launched in 2017 and has 100k+ downloads - rated with 4.5 stars.

SCAN QR CODE





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