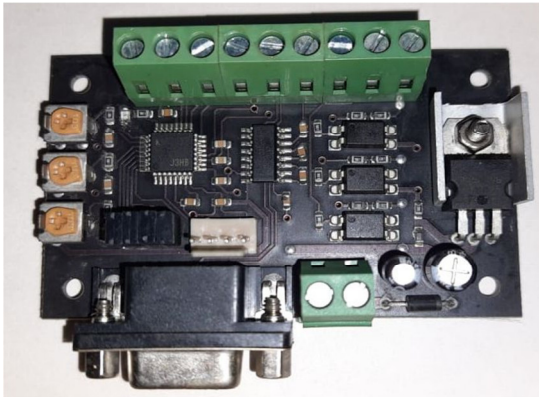


TNC-G11 Single Axis Pulse Generator



Document: Operation Manual
Document #:
Document Rev: 2.0

Product: TNC-G11
Product Rev: 2.0
Updated: Augest-2021

THIS MANUAL CONTAINS INFORMATION FOR INSTALLING AND OPERATING THE FOLLOWING PRODUCT:

- SINGLE AXIS PULSE GENERATOR

“TINY CONTROLS” AND THE TINY CONTROLS COMPANY’S LOGO ARE COPYRIGHT OF TINY CONTROLS (P) LTD. COMPANY. OTHER TRADEMARKS, TRADE NAMES AND SERVICE MARKS OWNED OR REGISTERED BY ANY OTHER COMPANY AND USED IN THIS MANUAL ARE THE PROPERTY OF THEIR RESPECTIVE COMPANIES

*TINY CONTROLS PRIVATE LIMITED
B-17/A, NISHAT PARK, KAKROLA, NEW DELHI, INDIA – 110078*

<https://www.tinycontrols.com>
PHONE: +91-991-119-3210, +91-83840-24665

GENERAL DESCRIPTION

The single axis pulse generator (SPG) is a powerful and versatile step pulse generator capable of generating step pulse and direction signal output for stepper drive. It is a standalone as well as PC controlled linear ramping pulse generator designed to be used with stepper motor drives.

It drives low jitter pulse train of frequency 50 KHz. The pulse train is smooth with linear ramps, preventing the motor stalling at high speeds. It accepts input in standalone/ manual mode as well as Rs-232 serial interface/ auto mode.

Manual mode allows direct interface of sensors/ switches to fed respective input signals at the input terminals according to sub modes selected. These are Start/ Stop- Dir, Start Dir CW-Start Dir CCW and Start-Stop. These signals are given to controller at their respective inputs. These sub-modes in manual mode are configured by using jumper settings. The SPG features an adjustable base speed/ starting speed and independent adjustment of acceleration.

Four ranges of speed are included and these ranges can be configured by jumper adjustments. Three potentiometers, for base speed, maximum speed and acceleration are given on the board. The potentiometers for maximum speed gives a provision to set the maximum speed at any value according to range selected. The base speed remains always lower than the maximum speed.

In auto/ serial mode, SPG is a PC controlled serial step pulse generator which provides exceptionally smooth operation. In serial mode, SPG works in jumper configurable two modes, offline mode and online mode. In online/ run from serial mode, the commands are input serially and executed one by one. Whereas in offline mode/ run from flash mode, the commands are first input serially and stored to flash and the whole command block is executed.

SPG consist three input terminals in which IN1 and IN2 are used as limits or general purpose inputs in program. The IN3 input terminal can be used for emergency/ limit switch making the system flexible enough. All these inputs are opto-isolated for noise immunity.

A 5V regulated output is also given on board for miscellaneous purposes.

FEATURES

- Serial (RS-232) interface to microcontroller or computer.
- Low jitter 50 KHz Pulse rate.
- Continuously adjustable Max motor velocity (steps/sec).
- Adjustable Acceleration (steps/sec/sec)
- Smooth pulse train with linear ramps, no more motor stalls at high motor speeds.
- Easy to use programming codes.
- Program sequence is saved in internal flash.
- Standard Step / Dir outputs interface to Stepper drives.
- Limit and Run/Pause/Resume inputs.
- Single axis pulse generator works in two modes: Serial command input with live pulse generation or storing sequence of command for later playback.

PHYSICAL AND ELECTRICAL CHARACTERISTICS

Contents	Specifications
Processor	16 bit processor
Communication Terminal	DB-9 for serial interface
Axes	Single axis
Max frequency of Step signal	40 KHz
Digital outputs	2
Digital inputs	3
Analog output 5V	1
Supply voltage	8V-24V DC
Max Power Consumption	3.5 W
Ambient temperature range	0°-55° Celsius
Relative Humidity	< 90% (without condensation)
Dimensions	70x40 (in mm)
Weight	20g

Operation Mode Setting		
MODE	J4	J1,J2,J3
Auto-Offline Mode	<i>OFF</i>	<i>Don't care</i>
Auto-Online Mode	<i>ON</i>	<i>Don't care</i>

Download Demo software for Auto-Offline and Auto-Online modes from our website, Refer to next section for RS-232 commands and protocol.

RS-232 Frame format and command structure

RS-232 frame consists of 8 bytes (0x denotes a hex number, but decimal equivalent number can be sent):

- Start byte, always 0x5A followed by
- One Address byte (Always 0x00) followed by
- One byte Parameter Number (or Command Number) followed by
- Four bytes Parameter Value (Least significant byte first) followed by
- End byte, always 0xA5

Parameter / Command List			
Parameter	No	4 bytes of data	Available in Online/Offline/Both Modes
Accel (Steps/Sec²)	0	0xNNNNNNNN	Both
Start Speed (Steps/Sec)	1	0xNNNNNNNN	Both
Max Speed (Steps/Sec)	2	0xNNNNNNNN	Both
Move (No. of Steps)	3	0xNNNNNNNN	Both
Wait Time (mSec)	4	0xNNNNNNNN	Both
Loop Count (number)	5	0xNNNNNNNN	Both
Send Command	6	0x00 : Stop move (if running)	Both
Send Command	6	0x01 : CW move (nSteps)	Both
Send Command	6	0x02 : CCW move (nSteps)	Both
Send Command	6	0x03 : CW infinite move	Both
Send Command	6	0x04 : CCW infinite move	Both
Send Command	6	0x05 : Move to IN1	Offline
Send Command	6	0x06 : Move to IN2	Offline
Send Command	6	0x07 : Reset Current Position	Both
Send Command	6	0x08 : Wait Time / Save Data	Offline : Wait Time Online : Save parameters
Send Command	6	0x09 : Program Begin	Offline
Send Command	6	0x0A : Program End	Offline
Send Command	6	0x0B : Loop Begin	Offline
Send Command	6	0x0C : Loop End	Offline
Send Command	6	0x0D : Enable Ext Speed Control	Offline
Send Command	6	0x0E : Disable Ext Speed Control	Offline
Send Command	6	0x0F : Wait for IN1	Offline
Send Command	6	0x0F : Wait for IN2	Offline
Read Command	7	0x00 : Read Current Accel	Online
Read Command	7	0x01 : Read Start Speed	Online
Read Command	7	0x02 : Read Max Speed	Online
Read Command	7	0x03 : Read Move (steps)	Online
Read Command	7	0x04 : Read Current Speed	Online
Read Command	7	0x07 : Read Current Position	Online

Demonstration Software:

Tstep-RS-232 Online Demo :: Tiny Controls Pvt Ltd

Port Name: Baud Rate: Settings: D8-Pn-S1 Status: ☐

Open Port Close Port

Device Address: <= Select Default Add = 0

Send Command:

0 : Stop Current Move (Use before next move)
 1 : Clock Wise Move (nSteps)
 2 : Anti Clock Wise Move (nSteps)
 3 : Clock-Wise Infinite Move
 4 : Anti-Clock-Wise Infinite Move
 5 : Move To Limit (Input IN1)
 6 : Move To Limit (Input IN2)
 7 : Set Current Position to Zero
 8 : Save Accl/Minv/MaxV/nSteps to Flash

Read Parameter:

0 : Acceleration (Steps/Sec/Sec)
 1 : Start Speed (Steps/Sec)
 2 : Max Speed (Steps/Sec)
 3 : Number of Steps (nSteps)
 4 : Current Speed (Steps/Sec)
 7 : Current Position (+/-Steps)

Parameters read from Device are shown below

Accl: Steps:
 StrtSpd: CurrSpd:
 MaxSpd: CurrPos:

Sent Data: Received Data:

Parameter name: Acceleration (Steps/Sec/Sec) Parameter Value: 20000 Send
 Start Speed (Steps/Sec) 20 Send
 Max Speed (Steps/Sec) 2000 Send
 Number of Steps (nSteps) 2000 Send

Tstep-RS-232 Offline Demo :: Tiny Controls Pvt Ltd

Build And Send Offline Program

Set Parameters

Always Select Device Address First: Always Select Device Address = 0

Parameter name	Parameter Value	Parameter name	Parameter Value
Acceleration (Steps/Sec/Sec)	20000	Number of Steps (nSteps)	2000
Start Speed (Steps/Sec)	20	Wait Time (mSec)	500
Max Speed (Steps/Sec)	2000	Loop Count (number)	0

Select Commands

Command Number: Command Name

0 : Stop Current Move
 1 : Clock Wise Move (nSteps)
 2 : Anti Clock Wise Move (nSteps)
 3 : Clock-Wise Infinite Move
 4 : Anti-Clock-Wise Infinite Move
 5 : Move To Limit (Input IN1)
 6 : Move To Limit (Input IN2)
 7 : Set Current Position to Zero
 8 : Wait Time
 9 : Program Begin
 10 : Program End
 11 : Loop Begin
 12 : Loop End
 13 : Enable External Speed Input
 14 : Disable External Speed Input
 15 : Wait for IN1
 16 : Wait for IN2

Enter Command Num and Press "ADD" Button.

0 / 250

Send Your Program

Port Name: Settings: D8-Pn-S1
 Baud Rate: Port Status: ☐

Open Port Close Port

Send Program Verify Program

STATUS:

Assembled Commands:

Corresponding Frames:

Clear Program and Start Over

Connection Diagram:

