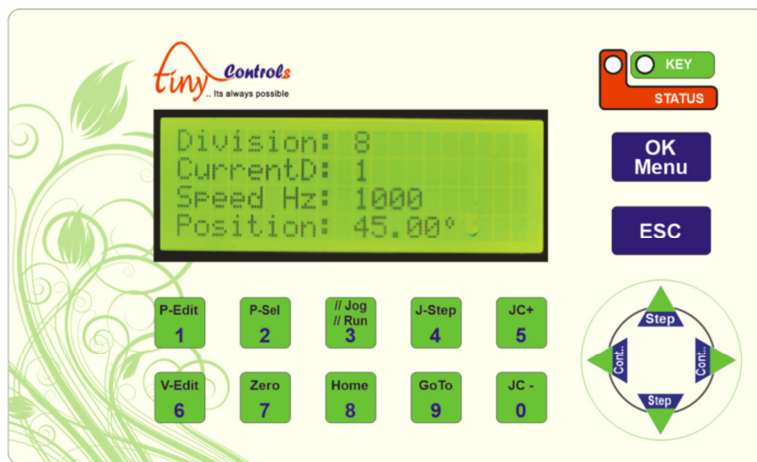




Single Axis Motion Controller – TNC-G01



*Document: Operation Manual
Document #: TNC-G01-2
Document Rev: 3
Product: TNC-G01
(Single Axis Indexing Controller)
Product Rev: 2.1
Created: 12-2022
Updated: 12-2023*

This manual contains information for installing and operating the following product:

- TNC-G01 , Single Axis Indexing Controller

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General Description

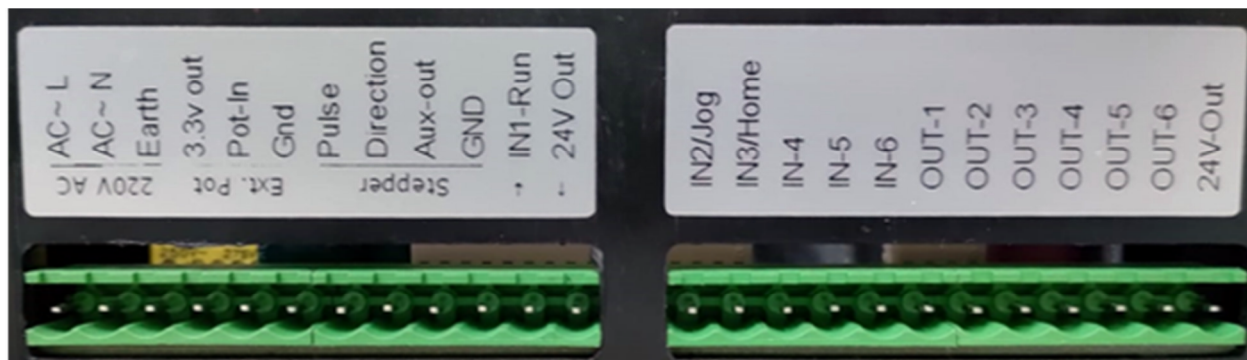
TNC-G01 is motion controller intended to be used in rotary table applications. It can be used to control continuous rotary motion or in Indexing applications.

In Indexing mode (i.e. division mode), there is no accumulation of error and the error is distributed along whole circular motion if the programmed movement cannot be achieved exactly due step angle not exactly divisible.

Specifications

- **Supply Voltage:** 90V to 250V AC 50Hz/60Hz
- **Pulse Rate:** 100 KHz
- **Overall Size:** 165mm x 102mm x 76 mm
- **Mounting:** Panel Cutout 155mmx92mm
- **Inputs:** Four NPN NO Inputs, 1 Analog Potentiometer Input
- **Outputs:** Three Outputs for Motors Step, Direction and Reserved
Six Open collector 24V relay driver
- **Display:** 20x4 Line alphanumeric
- **Temperature:** 55 Degree C Max operation temperature

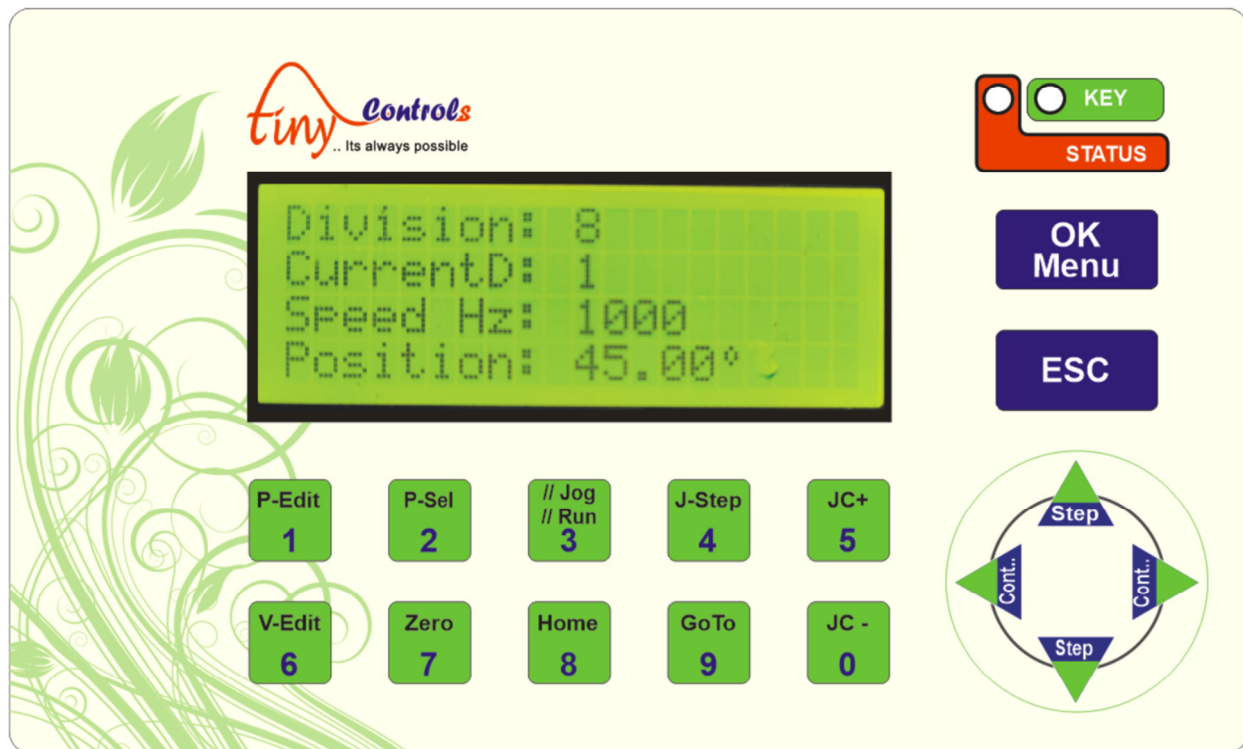
Connection



Pin Number (From Left to Right)

1-3	Power Supply Input (90V to 260V) AC 50Hz/60Hz & Earth
4-6	External Potentiometer Connection
7-10	Step, Direction, Reserved and Gnd Connection for Motor Driver
11	In1 Active Low Program-Run/Jog Run
12	24VDC supply output, can be used for relays/Sensor etc, Max current 200 mA
13	In2 Active Low Jog Run
14	In3 General Purpose NPN NO inputs, can be used for homing as well
15-17	General Purpose NPN NO inputs
18-23	OUT1 to OUT6 Open Collector Driver for Driving Relay or Controller Inputs
24	24VDC supply output, can be used for relays/Sensor etc, Max current 200 mA

Keypad



Numeric keys are used to enter values in editing or menu settings, alternate functions assigned to the numeric keys are explained below:

P-Sel & P-Edit: Are not used and reserved for later use.

//Run//Jog : This key toggles between “Jog” and “Run” mode screens

V-Edit : Variables shown in “Run” mode and advance Jog modes in “Jog” can be edited

Zero : In jog mode, this key resets the position to zero.

Home : Initiate homing cycle, “home” sensor input is used for homing and position is set to zero after completion.

Jstep : In Jog mode, sets the value of “Js” and used for Step (Degree) movement

Goto : In Jog mode, sets the position (Degree) to move the motor

JC+ : In Jog mode, each press Increases the motor speed by 10%

JC- : In Jog mode, each press decreases the motor speed by 10%

Step (Up) : Moves the motor in +ve direction by one “Jstep” Degrees

Step (Down) : Moves the motor in iv direction by one “Jstep” Degrees

Cont.. (Left) : Moves motor continuously at set speed in -ve Direction.

Cont.. (Right) : Moves motor continuously at set speed in +ve Direction.

OK/Menu : Confirms values, Long press to enter Setting menu.

ESC : Cancel saving of values, exit menu, stops some movement, cancel homing cycle etc.

Operation

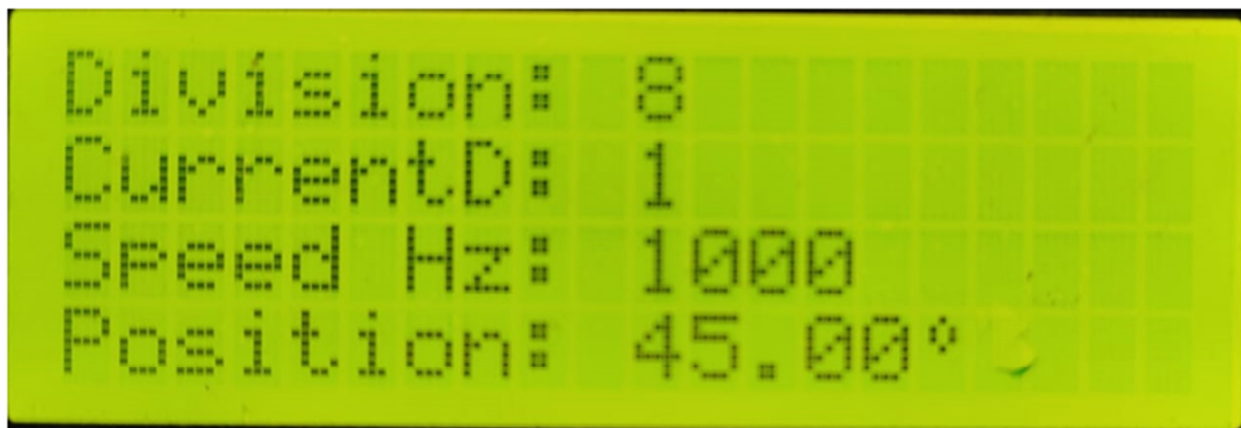
//Run//Jog : This key toggles between “Jog” and “Run” mode.

Controller works in two modes:

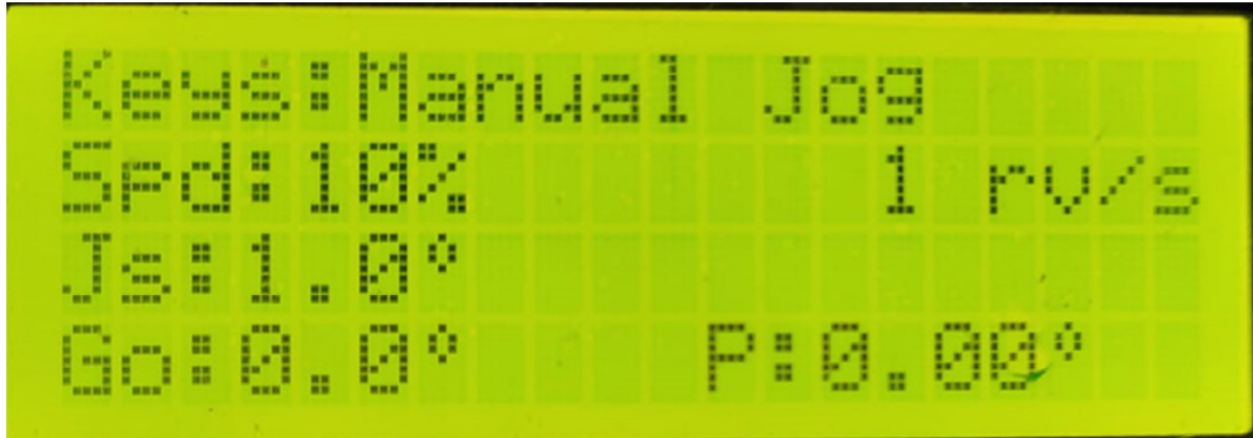
- 1) RUN (Index Mode)
- 2) JOG Mode

In Run mode, the controller simply does the Indexing function:

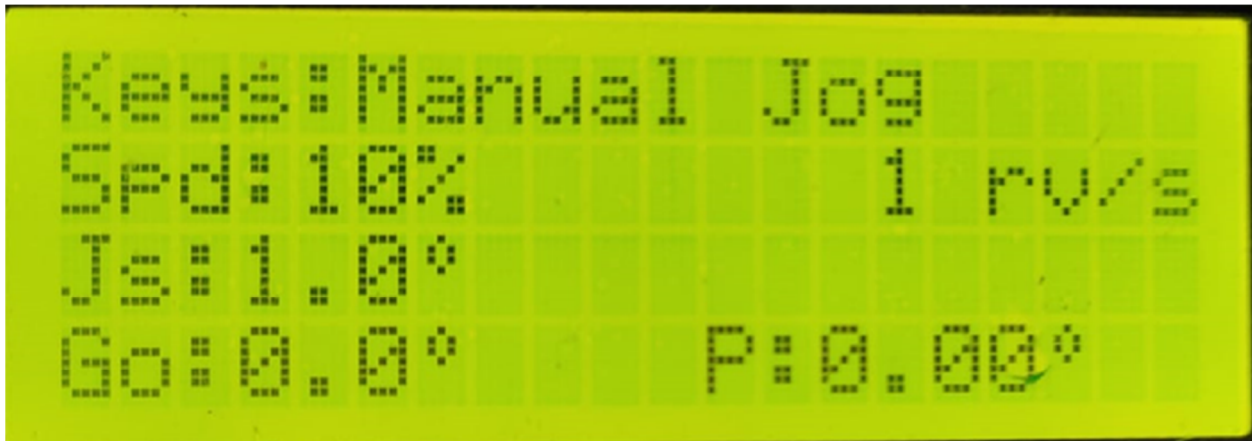
- Use V-Edit key to edit “Division” and “Speed Hz” variables
- “Division” is the number of parts you want to divide the whole circle, example below shows its set to “8”
- “Speed Hz” is the Pulse frequency for the motor driver
- Acceleration configuration can be set in “Settings” Menu
- Note : The actual movement of motor honors the “Gear Ratio” in the “Setting” Menu
- “CurrentD” shows the current position in division unit
- “Position” shows the current position in degree unit
- Use “Up” / “Down” keys to index by one division in the forward / reverse direction
- See advanced function section for using inputs for indexing



In Jog mode, the Jog screen is shown as below



- “Up/Down” keys moves the motor by angle specified in “Js” variable, in forward/reverse direction respectively
- “Left/Right” keys moves the motor for continuously in forward/reverse direction respectively
- “Goto” key edits **and moves the motor** to a specified angle position
- “JC+” key increases motor speed by in 10% increments
- “JC-” key increases motor speed by in 10% increments
- “J-step” key edits the Js (step size) value
- “Goto” key edits **and moves the motor** to a specified angle position
- “Zero” key resets the current position to zero but **doesn’t move the motor**
- “Home” key is used to initiate homing cycle using input “Home”
- See advance feature section for “V-Edit” function



Jogging can be controlled/performed using “arrow keys” or using Inputs “IN1 & IN2”. First line shows the mode used for operation and can be selected by “**V-edit**” key.

Following modes are available:

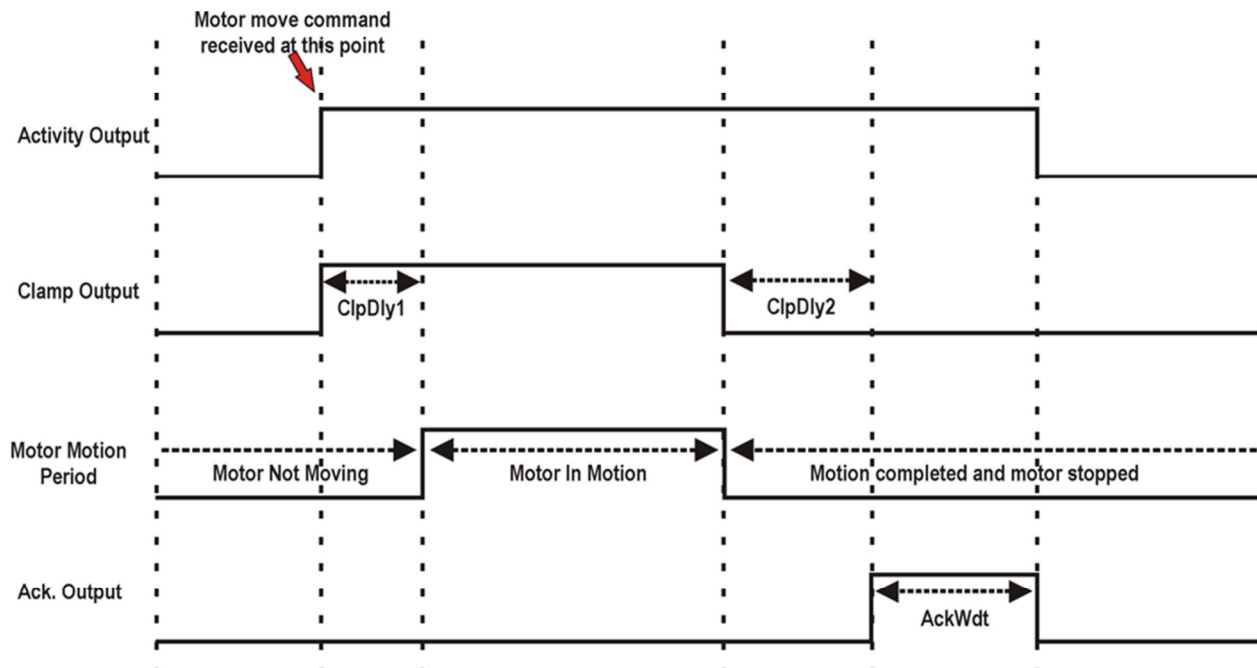
- **“Keys: Manual Jog”** – use “Up/Down” keys for step movement, “Left/Right” keys for continuous movement.
- **“Inputs: CW priority”** - “IN1 & IN2” rotate motor in CW/CCW direction, if both inputs are active CW direction input takes priority.
- **“Inputs: CCW priority”** - “IN1 & IN2” rotate motor in CW/CCW direction, if both inputs are active CCW direction input takes priority.
- **“Inputs: Start/Start”** - “IN1 & IN2” triggers motion start CW/CCW direction respectively, to stop motor same input is used to triggers the stop action.
- **“Inputs: Start/Stop”** - “IN1 & IN2” inputs triggers Start/Stop actions, default direction set in the setting menu is used.
- **“Inputs: Step mode”** - “IN1 & IN2” inputs triggers “Step” movement in CW/CCW directions respectively.

Other advance feature available is related to the behavior of the 6 outputs:

There are 3 pairs of outputs available

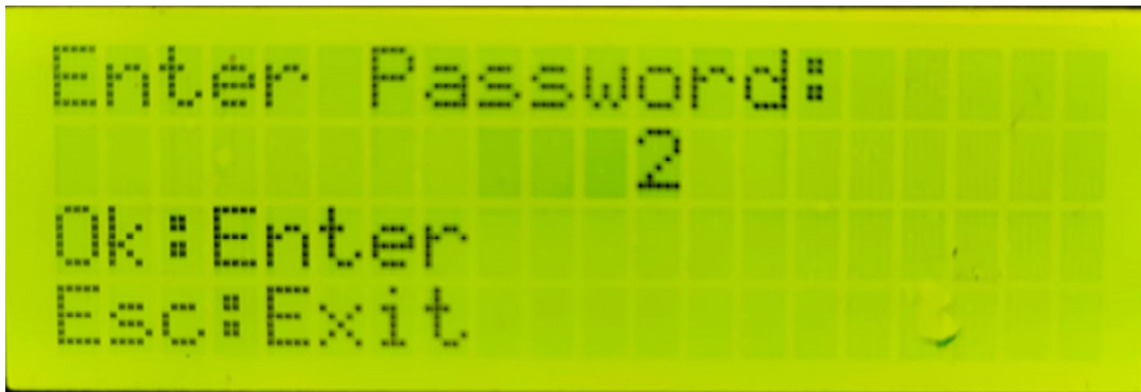
- ***Clamp & Clamp :*** *Can be used for activation of motor brakes*
- ***Activity & Activity:*** *Can be used for Job clamping in automated process*
- ***Ack. & Act.:*** *Can be used to signal to other system for further operation after indexing*
- ***Each of above pairs are complementary, for example when Clamp is High, Clamp will be low and vice versa***

Output state flow is shown in following diagram and the three delay parameters named “ClpDly1”, “ClpDly2” and “AckWdt” can be set in the “Settings menu.



Settings Menu

Long press OK key to enter Setting menu, default password is "2626"



Following settings can be changed from this menu:

SN	Setting Name	Description	Range / Allowed Values / Selectable Options
1	Motor Dir	Motor Default Direction	Normal or Invert
2	Home Dir	Motor Homing Direction	Normal or Invert
3	Gearing	Gear Ratio for Motor	0.01 to 9999.99
4	Stp/Rot	Steps per Rotation for Motor	1 to 99999
5	Stp/Sec	Speed Steps per Sec for Motor	1 to 99999
6	Accel	Acceleration for Motor	1 to 99999
7	HomSped	Motor Homing Speed	1 to 99999 Steps per Second (Limited to Motor Speed)
8	HomAccel	Motor Homing Acceleration	1 to 99999
9	JogSped	Motor Jogging Speed	1 to 99999 Steps per Second (Limited to Motor Speed)
10	ClpDly1 ms	Camping Delay	1 to 99999 in mS
11	ClpDly2 ms	Unclamping Delay	1 to 99999 in mS
12	AckWdt ms	Ack. Output pulse width	1 to 99999 in mS
13	ExtPot	External Potentiometer Enable	Enable or Disable Used in Continuous Mode for speed control
14	FactoryRst	Reset Settings or Programs	Select "Settings" or "Programs" to defaults
15	Ucnt	Lifetime Motion Counter	Displays number of programs executed so far (Not resettable by user)
16	TNC-G01 V	Displays Software version	Only of information about the controller