TNC-G09 Drill controller

Document: Operation Manual
Document #: T09
Document Rev: 2.0

Product: TNC-G09 Drill controller
Product Rev: 1.0
Created: Jan, 2014
Updated: Dec, 2014

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

- **TNC-G09 DRILL CONTROLLER**

TINY CONTROLS PRIVATE LIMITED
C-55, NISHAT PARK, KAKROLA MOR, NEW DELHI, INDIA – 110078
WEB: http://www.tinycontrols.com
PHONE: +91-991-119-3210

CONTENTS

GENERAL DESCRIPTION

Tiny Controls' drill controller is a new concept for drilling operations. It is an economical solution designed to automate the repetitive drilling tasks. Two setups named Msetup and Rsetup are provided in the system. Msetup (Main setup) controls the motion parameters of stepper motor and Rsetup (Run set up) controls the drilling speed, depth of drill and number of steps in one drill round.

The following commands are supported by device: (see Setup section for more details)

Msetup: Steps/mm, mm/min, Seek rate, Accel, Dir, Fr Reset

Rsetup: Feed rate, Drill Steps, Drilling depth

SPECIFICATION/FEATURES:

- **Supply Voltage:** 90V to 250V AC 50Hz/60Hz
- **Max Pulse Rate:** 40 KHz
- **Overall Size:** 165mm x 102mm x 76 mm
- **Mounting: Panel mount:** 155mm x 92mm
- **Control:**

  Jogging

  Longitudinal speed control
- **Inputs:** 3 NPN Proxy (Msetup, Msetup and Home) + 1 On-Off switch for start- stop
- **Outputs:** 2 (Step and Direction) for motor +two 12 V outputs (for NPN proximity type sensor) + 5 V output.
- **Display:** 20x4 LINES alphanumeric LCD
- **Operating interface:** User friendly keys
- **Max Operating Temperature:** 55 deg C

LOCATION OF COMPONENTS: Major components of Drill Controller

The description of these components is as following:

1. NUMERIC KEYS (0-9)

Numeric keys are used for entering the numeric values in Msetup and Rsetup screen. Some numeric keys are used for alternative purposes also.

2. NAVIGATION KEYS PANEL (UP, DOWN, RIGHT, LEFT)

In Msetup and Rsetup screen, these keys are used to navigate the cursor. However, in the home screen, up-down navigation keys are used for changing the jog speed and right-left navigation keys are used for altering the position of drill w.r.t its home position.

3. OK & Esc

Press OK to enter in Msetup and Rsetup screen when their respective terminals are shorted. In both the setup screens, pressing this key saves the modified values in EEPROM. Press Esc to back out of the setup screens without saving the changes in the values.

4. LCD DISPLAY (20x4)

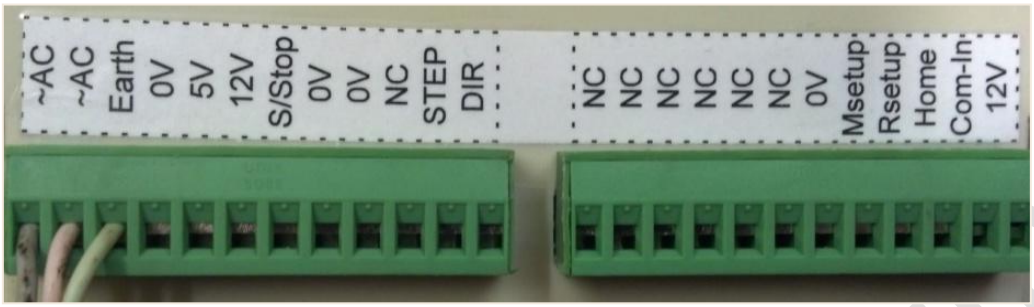
This LCD shows all the information related to setup screens and the Home screen.

5. LEDs

The GREEN LED glows at time of homing and activity. It also indicates the long press of left-right navigation keys. GREEN LED indicates long press of up-down navigation keys.

TERMINALS

REMOVABLE BLOCK TERMINALS:



PIN NUMBER

1. ~AC (90V to 250V AC 50Hz/60Hz Live, Handle with care)
2. ~AC (90V to 250V AC 50Hz/60Hz Neutral, Handle with care)
3. Earth (To Earth Main line, Handle with care)
4. 0V (Common ground).
5. 5V OUTPUT
6. 12V OUTPUT (For NPN type proximity sensors).
7. Start- Stop: Connect the on-off switch here.
8. 0V (Common ground, For NPN type proximity).
9. 0V (Common ground, Connect to Stepper Driver e.g. Tstep-484).
10. NC- not connected.
11. Step- Step Pulse Output for motor (Connect to Stepper Driver e.g. Tstep-484).
12. Dir - Direction output for motor (Connect to Stepper Driver e.g. Tstep-484).
13. NC- not connected
14. NC- not connected
15. NC- not connected
16. NC- not connected
17. NC- not connected
18. NC- not connected
19. 0 V (Common Ground for proximity switches).
20. Msetup Connect output of NO, NPN type proximity switch).
21. Rsetup (Connect output of NO, NPN type proximity switch).
22. Home (Connect output of NO, NPN type proximity switch)
23. Com-In (Common for Msetup, Rsetup and home inputs, can be supplied external 12 volt or jumped from 12v output from the controller)
24. 12V OUTPUT (For NPN type proximity)

OPERATING DRILL CONTROLLER

Home Screen:

When power is applied to the device, the splash screen appears and after that the Home screen appears. The user can change the position and jogging speed parameters here and nowhere else. Jogging speed can be adjusted by using up- down navigation keys and position can be adjusted using left-right navigation keys. Two setup menus terminals are provided in the system. All the terms displayed in the above screen are discussed in the subsequent sections.

P: Position- It is the current position of the drill tool w.r.t its home position. Speed for the change of position of drill w.r.t. its home position depends on the jogging speed set

O: Offset- It is the distance between the home position of drill tool and job surface. Press key 7 to set the offset value. First, jog the motor to required position. Press key 7 and the offset sets as the position value set.

F: Feed rate- It is the speed with which drill rotates.

D: Depth- It is the depth which is the drill has to reach on the surface in total number of steps.

S: Drill Steps- It is the number of steps that the drill needs to undertake to achieve the total drill depth. For example: If depth is 100mm and steps are 5, then drill in each step is 20mm. The drill makes 20mm drill in each step, five times.

C: Count- After completing the drill depth, an increment in count. Press key 6 to reset the count.

NOTE: There is a homing feature available on key 8. If user presses key 8 on home screen, the motor moves to respective home position and searches for home sensor input. The home speed can be adjusted in Set up screen for respective mode.

Msetup:

To enter in the Main setup menu, short the Msetup terminal and press Ok key when the controller is in home screen. The following screen appears for Msetup.

LIST OF COMMANDS

Steps/ mm:

The Number of steps stepper motor moves per mm. The range is 0001 to 9999.

Speed (mm/min):

This parameter decides the maximum speed with which the motor moves. It can be 0001 to 9999 mm per minute. However, the value for maximum speed depends on steps/revolution value.

Seek rate:

It is the speed at which motor move to its home position.

Accel (value) range is 01 to 20

This command is used to set acceleration value for stepper motor.

Dir:

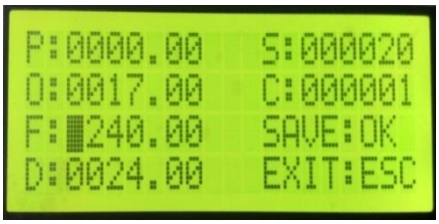
This parameter decides direction of the stepper motor, whether to move in clockwise or counter clockwise direction when start button is pressed.

Fr reset:

This parameter resets all the parameters to factory defaults.

Rsetup:

To enter in the Run setup menu, short the Rsetup terminal and press Ok key when the controller is in home screen. The following screen appears for Rsetup.

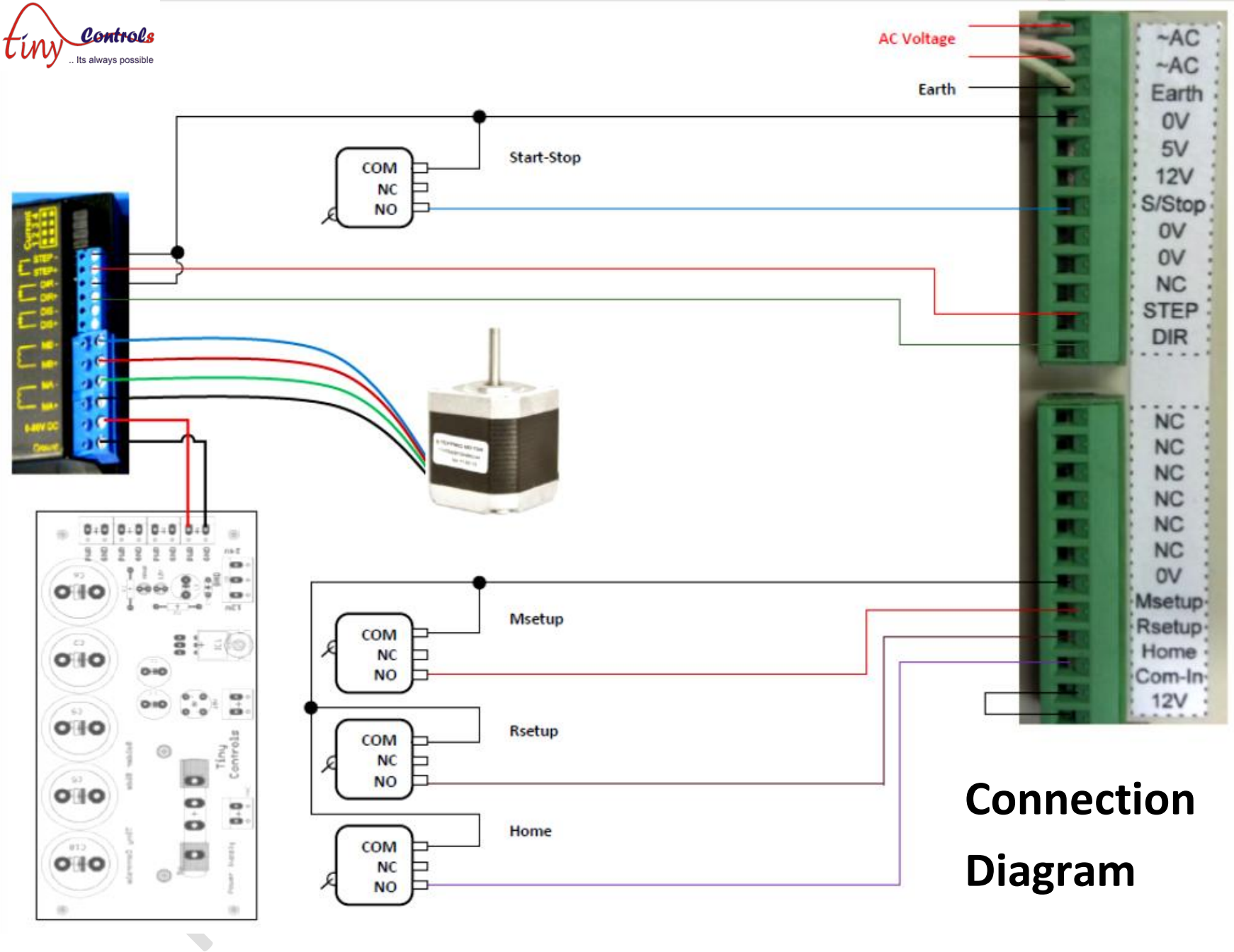


The user can alter the feed rate, drill depth and Drill steps in Rsetup menu. Press Ok key to save the changes else press Esc to exit without saving.

Homing

Homing feature is available on key 8. If the user presses key 8 in home menu, the motor moves to respective home position and searches for home sensor input. The home speed can be adjusted in set up screen for respective mode. Pressing Esc key cancels the command.

tiny Controls
.. Its always possible



Connection Diagram