Stepper motor controller with home positioning sensor

1. Description

The stepper motor controller is designed to control three stepper motors corresponding to three rotation stages. It can be used to control linear stages as well but, as limit switch functionality is not provided, other precautions must be taken to facilitate it. It has [dsPIC33fj128gp802](https://www.microchip.com/wwwproducts/en/dsPIC33FJ128GP802) micro-controller. Two serial ports are provided: one communicate with slave & one with master. Up to three controllers can be used in tandem. Three motor controller ports are provided that include & homing detection too.

1. Sent Commands & responses

Configuration of serial port is baud rate: 115200, parity: N, stop bits: 1 and data bits: 8. Set of serial commands to operate the controller are given below. All the commands must start with ‘<’ and end with ‘>’ as shown in the table.

***n***: motor number (1, 2 or 3)

***f***: frequency of the pulses (1 to 216-1)

***p***: number of pulses (1 to 232-1)

|  |  |  |
| --- | --- | --- |
| Command sent | Return | Function |
| <***n***H> | ***n***H | Go gome in positive direction  e.g., <1H> |
| <***n***h> | ***n***h | Go home in the negative direction  e.g., <1h> |
| <***n***Q> | ***n***Q | Halt the motor  e.g., <1Q> |
| <***n***F***f***> | ***n***A | Change the frequency of the pulses i.e. speed  e.g., <1F1000> |
| <***n*+*p***> | ***n***A, ***n***R | Rotate the motor by given number of pulses, in positive direction  e.g., <1+1000> |
| <***n*-*p***> | ***n***A, ***n***R | Rotate the motor by given number of pulses, in  negative direction  e.g., <1-1000> |

1. Responses & diagnosis

Possible responses and their cause is given below. All the responses are of 4 character length: two alphanumerical characters superseded by a newline character (‘\n’) and a null character (‘\0’). Hence, these responses can be read as lines.

|  |  |
| --- | --- |
| Command received | Diagnosis |
| ***n***H | Reached home in positive direction |
| ***n***h | Reached home in negative direction |
| ***n***Q | Motor halted |
| ***n***A | Command is acknowledged |
| MA | Command is acknowledged by the master and it is forwarded to the slave controller |
| ***n***R | All the pulses have been sent |
| ***n***X | Motor number is right but wrong function command |
| MX | Wrong command altogether |
|  |  |