**Laboratory 4**

**Stepper Motor Operation**

**Pre-Lab**

**Team Number 5**

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**LAB 4 – Stepper Motor Operation**

For this laboratory, we entered the unknown realm of stepper motor. We will use a Vextra stepper motor and interface it with a coded subroutine for our board. To prepare for this laboratory, multiple datasheets and other errata had to be read. Among these items were motor control board schematic diagram, the Allegro 2916 datasheet and the Vextra motor specifications. We will demonstrate the use of one phase, two phase, and half step modes of the stepper motor through the use of phase and current.

1. Below is our table demonstrating the function of “one phase on” stepping.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **One Phase On** | |  |  |  |  |
|  | **Step** | **1** | **2** | **3** | **4** |
| **Top-Bottom** | **PHASE1** | 0 | X | 1 | X |
|  | **I1-1,I0-1** | 00 | 11 | 00 | 11 |
|  |  |  |  |  |  |
| **Left-Right** | **PHASE2** | X | 0 | X | 1 |
|  | **I1-2, I0-2** | 11 | 00 | 11 | 00 |

1. Below is our table demonstrating the function of “two phase on” stepping.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Two Phase On** | |  |  |  |  |
|  | **Step** | **1** | **2** | **3** | **4** |
| **Top-Bottom** | **PHASE1** | 0 | 1 | 1 | 0 |
|  | **I1-1,I0-1** | 00 | 00 | 00 | 00 |
|  |  |  |  |  |  |
| **Left-Right** | **PHASE2** | 1 | 1 | 0 | 0 |
|  | **I1-2, I0-2** | 00 | 00 | 00 | 00 |

1. Below is our table demonstrating the function of half steps for stepping.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Half-Step** | |  |  |  |  |  |  |  |  |
|  | **Step** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **Top-Bottom** | **PHASE1** | 0 | 0 | X | 1 | 1 | 1 | X | 0 |
|  | **I1-1,I0-1** | 00 | 00 | 11 | 00 | 00 | 00 | 11 | 00 |
|  |  |  |  |  |  |  |  |  |  |
| **Left-Right** | **PHASE2** | X | 1 | 0 | 1 | X | 0 | 1 | 0 |
|  | **I1-2, I0-2** | 11 | 00 | 00 | 00 | 11 | 00 | 00 | 00 |