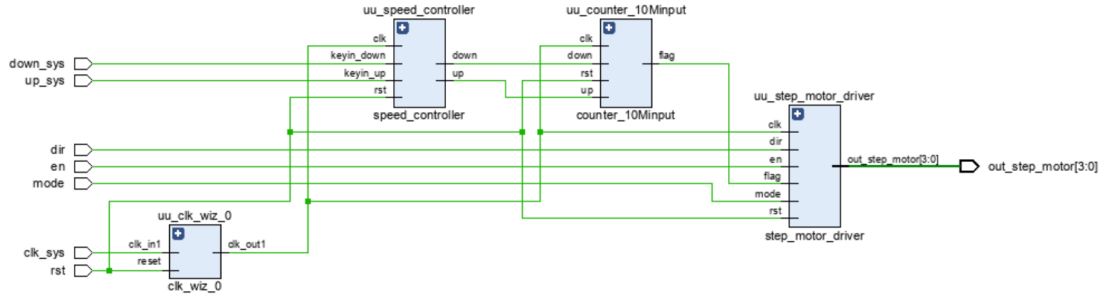
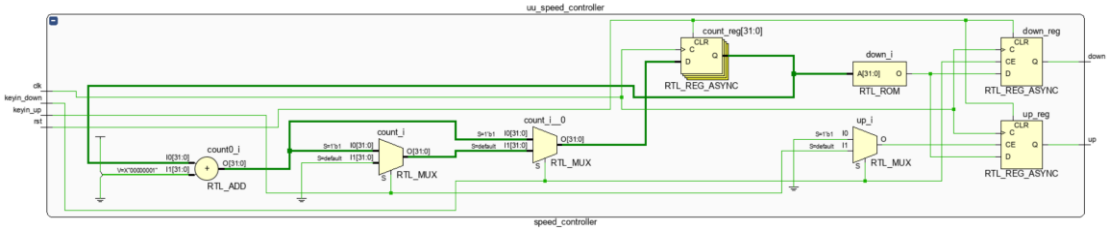
Lab4 Step Motor

1. Design diagram of the system

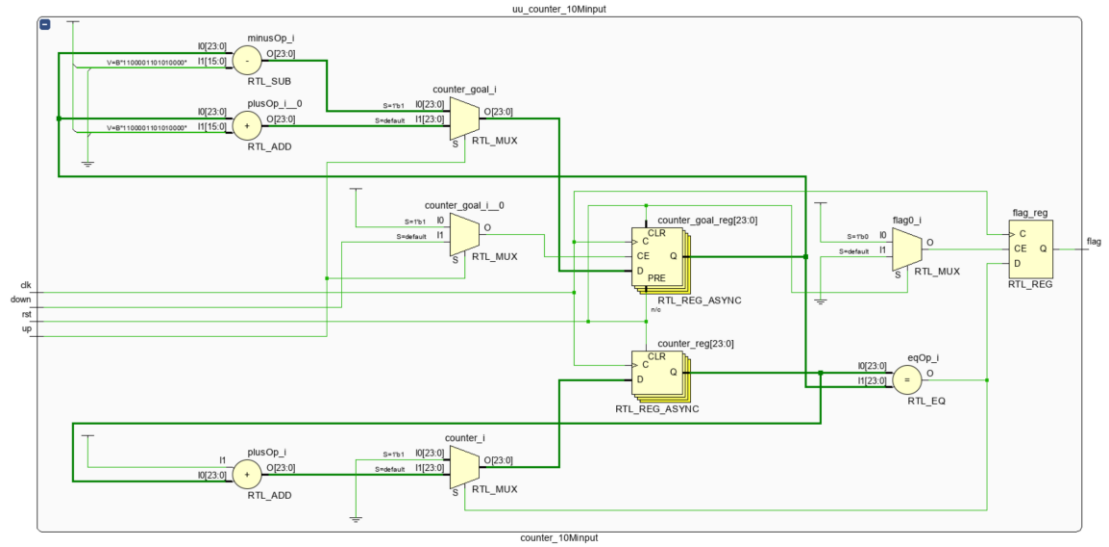
Top design diagram of the system



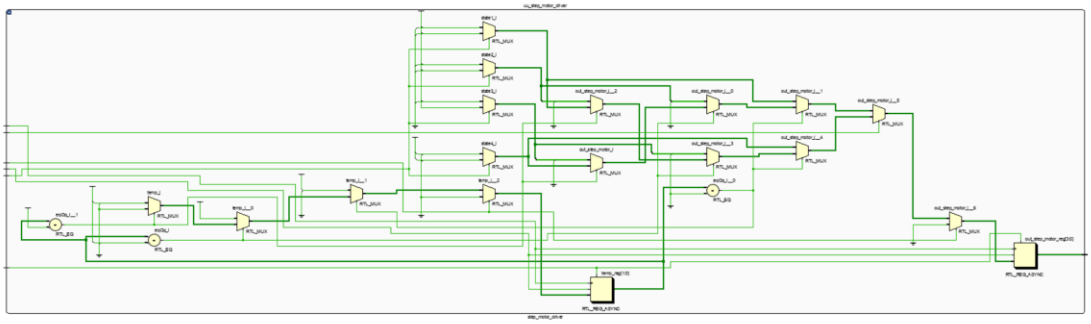
Module ‘speed_controller’ design diagram



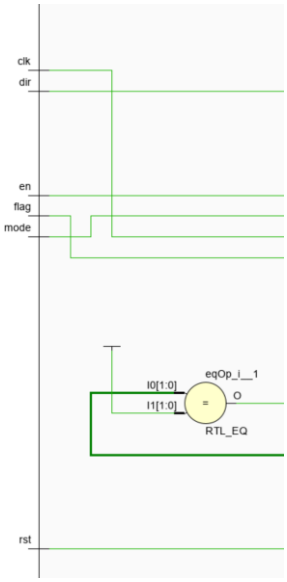
Module ‘counter_10Minput’ design diagram

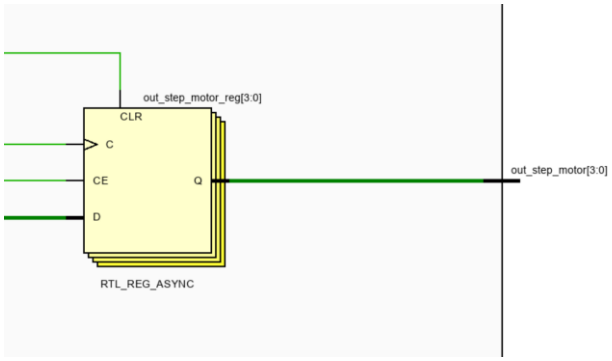


Module ‘step_motor’ design diagram



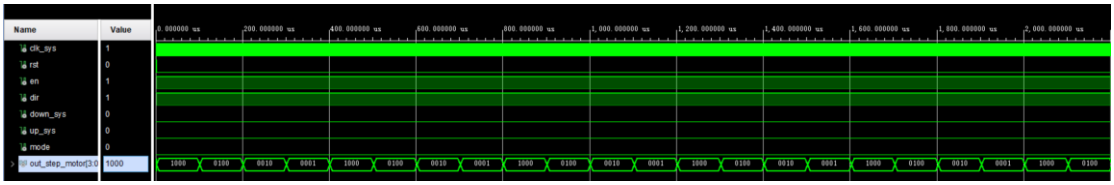
With the inputs and outputs are



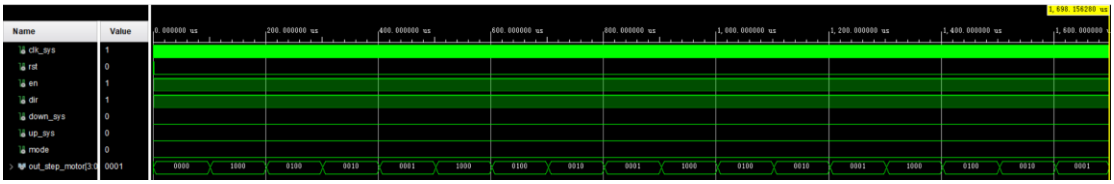


2. Simulation Results

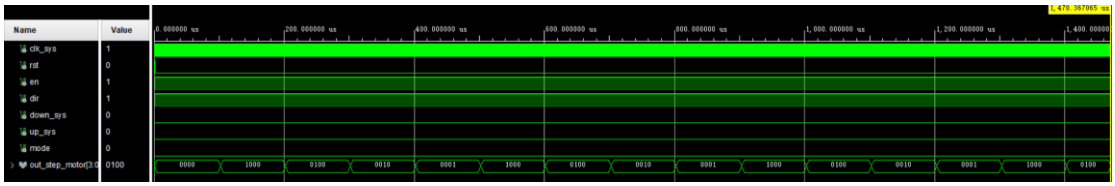
Behavior simulation



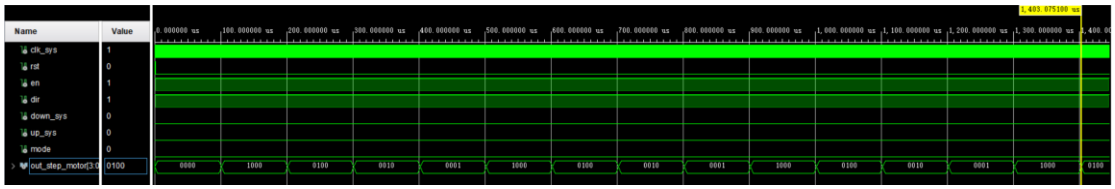
Post-synthesis functional simulation



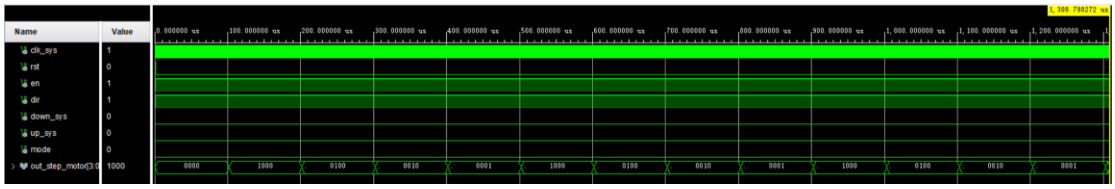
Post-synthesis timing simulation



Post-implement functional simulation



Post-implement timing simulation



For the change of direction and mode is just a little modification to the outputs in the same logic chain, and due to time limit, the simulation of these cases are not shown in this report.

3. Utilization and power usage

Utilization Post-Synthesis | **Post-Implementation**

Graph | **Table**

Resource	Utilization	Available	Utilization %
LUT	96	63400	0.15
FF	85	126800	0.07
IO	11	210	5.24
BUFG	2	32	6.25
MMCM	1	6	16.67

Power **Summary** | On-Chip

Total On-Chip Power:	**0.191 W**
Junction Temperature:	**25.9 °C**
Thermal Margin:	59.1 °C (12.8 W)
Effective ϑJA:	4.6 °C/W
Power supplied to off-chip devices:	0 W
Confidence level:	Low

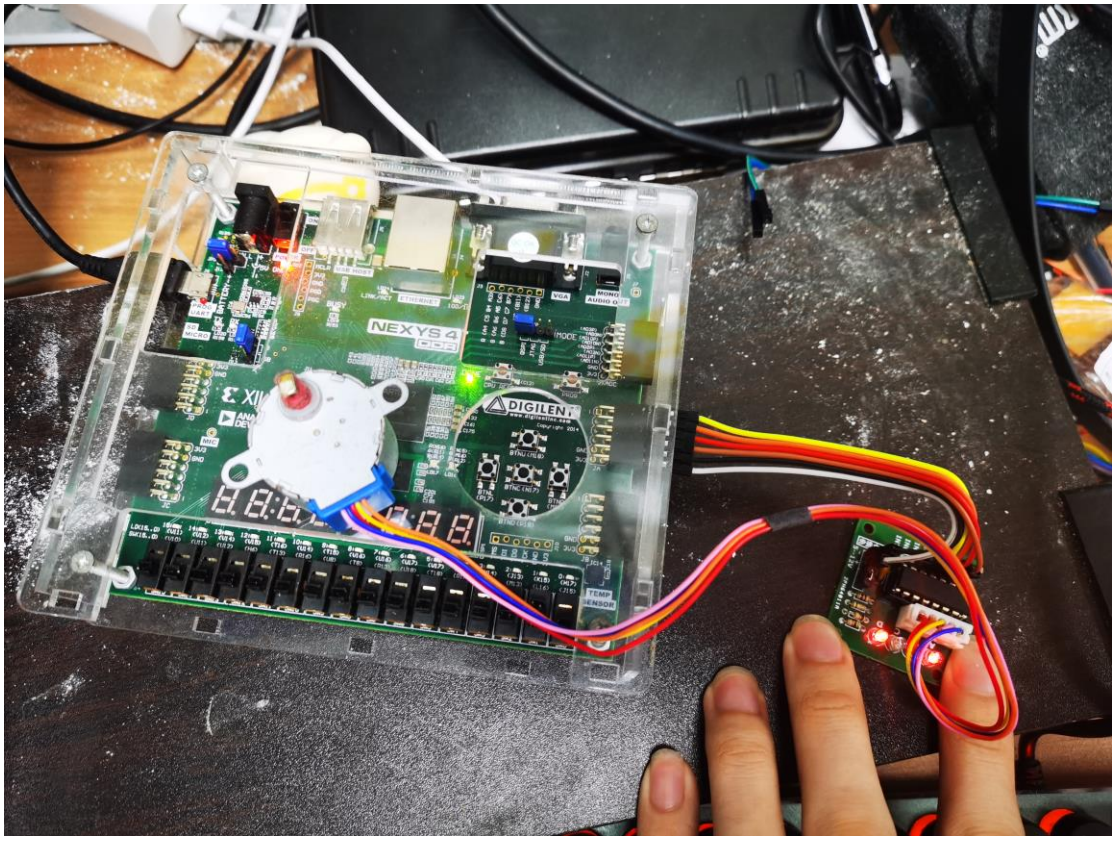
Implemented Power Report

4. On board test

We use full step mode to implement the test, and here is the results.

After the testing, all module works normal, and all functions (enable, change speed, change direction, change mode) can be realized.

A detailed test can be shown when demonstration.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