

Example Project

Running a PMSM Motor with Space Vector Modulation and Field Weakening

The Example code was build in mikroC for dsPIC and is a port from the Microchip Application Note AN1017.

The Code runs a PMSM motor with SVM (Sinusoidal Voltages and includes phase advance), applying phase advance (field weakening) the motor useable speed range is increased and produces less current ripple compared to Block commutation. However it must be kept in mind that phase advance reduce high speed torque of the motor and produce heat in the rotor care must be taken with this method.

The example is code for the MCLV development board from MCHP and a Hurst 24V motor with Hall sensors, SVM code can be used with any motor with 3 hall sensors. I used the dsPIC33FJ128MC804 PIM module on the Board.

The Code allows for 4 Quadrant operations

- Forward
- Reverse
- Forward Braking
- Reverse Braking

The CAN module is used to send operational data out side world

Below a picture of the MCLV Board,



How to run the motor with and with out Phase advance

In the MotorControl Variables header file uncomment the definition

```
#define PHASE_ADVANCE
```

This will activate the Phase advance in the SVM algorithm and the motor speed will increase from +/- 3000 Rpm to 6000 Rpm

Speed plot of the Motor with Phase advance



The Code does not implement a PID speed controller it is left to the user to implement as an exercise

Note : You should use Fractional Q15 library and the dsp MAC library of the mikroC compiler to achieve this enjoy