



SilverPakT Integrated Controller/Driver and Motor

Sample Code

Version 1.00

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Sample code

General Parameters

```
//TMCL Sample Setup Program
StallValue = 0 // StallGuard Threshold (0 = off)
Velocity = 2047 // Max Velocity
Acceleration = 1100 // Max Acceleration
ustep = 4 // 4 = 16X u-stepping
pdiv = 3 // pdiv @ default
rdiv = 8 // rdiv
current = 600 // 600 mA Peak
Hcurrent = 300 // 300 mA Peak
decay = 0 // 2048 = on, 0 = off

//Initialization of above parameters
SAP 6, 0, current //Setting Current
SAP 203, 0, decay //Switch Mixed Decay
SAP 5, 0, Acceleration //Setting max acceleration
SAP 205, 0, StallValue //Setting StallGuard Threshold
SAP 140, 0, ustep //Setting u-stepping
SAP 143, 0, Hcurrent //Max Hold Current
SAP 154, 0, pdiv //Initializing pdiv
SAP 4, 0, Velocity //Setting maximum Velocity
SAP 138, 0, rdiv //Ramp Divisor
ROR 0, 1049 //Rotate Right Continuously
WAIT TICKS, 0, 1000 //Wait for 1000 msec before issuing next command
MST 0 //Stop Motor # 0
STOP //End program
```

Potentiometer Control #1 – Run continuously

```
//TMCL POT Control for TMCM-110. This will move step motor
//up to top speed when pot is turned to maximum, when pot is 0, motor is 0 speed

//Parameters
StallValue = 0 //StallGuard Threshold (0 = off)
Velocity = 2047 //Max Velocity
Acceleration = 1000 //Max Acceleration
ustep = 1 //4 = 16X u-stepping
pdiv = 8 //pdiv @ default
rdiv = 8 //rdiv
current = 600 //600 mA Peak
Hcurrent = 300 //300 mA Peak
decay = 2048 //2048 = on, 0 = off
speed = 500 //Rotation Speed of ROR Command

//Connect pot: 1 side to +5V output, pin 8. Other side to GND, pin 6,
//and the middle wire to the input line, pin 7. Pot resistance acts as a voltage divider

//Initialization of above parameters
SAP 6, 0, current //Setting Current
SAP 203, 0, decay //Switch Mixed Decay
SAP 5, 0, Acceleration //Setting max acceleration
SAP 205, 0, StallValue //Setting StallGuard Threshold
SAP 140, 0, ustep //Setting u-stepping
SAP 143, 0, Hcurrent //Max Hold Current
SAP 153, 0, rdiv //Initializing rdiv
SAP 154, 0, pdiv //Initializing pdiv
```

```

SAP 4, 0, Velocity      //Setting maximum Velocity
SAP 138, 0, 2          //Ramp Mode

//Main
main:
  GIO 0, 1              //read pot
  CALC MUL, 17          //Run calculations to make it a valid number
  CALC DIV, 10
  WAIT TICKS, 0, 5     //Small Delay
  AAP 132, 0           //transfers result to target position
  JA main              //Infinite Loop
  STOP                //End of Program

```

Potentiometer Control #2 – CW and CCW rotation

```

//TMCL POT Control for TMCM-110. This will move step motor
// when pot is 0, motor is rotating CW, when pot is half way, motor is stopped,
// when pot is max, motor is rotating CCW (depending on connection of motor)

```

```

StallValue = 0          //StallGuard Threshold (0 = off)
Velocity = 2047         //Max Velocity
Acceleration = 1000    //Max Acceleration
ustep = 1              //4 = 16X u-stepping
pdiv = 8               //pdiv @ default
rdiv = 8               //rdiv
current = 600          //600 mA Peak
Hcurrent = 300         //300 mA Peak
decay = 2048           //2048 = on, 0 = off

```

```

//Connect pot: 1 side to +5V output, pin 8. Other side to GND, pin 6,
// and the middle wire to the input line, pin 7. Pot resistance acts as a voltage divider

```

```

//Initialization of above parameters
SAP 6, 0, current      //Setting Current
SAP 203, 0, decay     //Switch Mixed Decay
SAP 5, 0, Acceleration //Setting max acceleration
SAP 205, 0, StallValue //Setting StallGuard Threshold
SAP 140, 0, ustep     //Setting u-stepping
SAP 143, 0, Hcurrent  //Max Hold Current
SAP 154, 0, pdiv      //Initializing pdiv
SAP 4, 0, Velocity    //Setting maximum Velocity

```

```

LOOP:
  GIO 0, 1              // get status of analog input
  COMP 0                // compare to value 0
  JC EQ, GORIGHT       // rotate right if equal
  COMP 1015            // compare to value 1015 (1023 is highest)
  JC GE, GOLEFT        // rotate left if greater or equal to 1015
  JC LT, STOPMOTOR     // stop motor if less than 1015
  JA LOOP              // loop continuously
  STOP

```

```

GORIGHT:              //Rotate right if pot is at min
  ROR 0, 1000
  GAP 1, 0
  COMP 1000
  JC GE, STOPMOTOR
  JA LOOP

```

```

GOLEFT:                                //Rotate left if pot is at max
    ROL 0, 1000
    GAP 1, 0
    COMP 0
    JC LE, STOPMOTOR
    JA LOOP

STOPMOTOR:                              //Stop rotation if pot is in the middle
    MST 0
    JA LOOP

```

Potentiometer Control #3 – Position control

//TMCL POT Control for TMCM-110. This will move motor 2400 steps if pot is 0,
// and move back to position 0 (back by 10000 steps) if pot is max. It will not
// rotate if pot is in middle

```

//Parameters
StallValue = 0           //StallGuard Threshold (0 = off)
Velocity = 2047         //Max Velocity
Acceleration = 1000     //Max Acceleration
ustep = 1               //4 = 16X u-stepping
pdiv = 8                //pdiv @ default
rdiv = 8                //rdiv
current = 600           //600 mA Peak
Hcurrent = 300          //300 mA Peak
decay = 2048            //2048 = on, 0 = off

```

//Connect pot: 1 side to +5V output, pin 8. Other side to GND, pin 6,
// and the middle wire to the input line, pin 7. Pot resistance acts as a voltage divider

```

LOOP:  GIO 0, 1          // get status of analog input
    COMP 0               // compare to value 0
    JC EQ, CLOSE_VALVE  // rotate right if equal
    COMP 500            // compare to value 500
    JC GE, OPEN_VALVE   // rotate left if greater or equal to 1015
    JC LT, STOPMOTOR    // stop motor if less than 1015
    JA LOOP              // loop continuously
    STOP

```

```

OPEN_VALVE:
    MVP ABS, 0, 10000
    JA LOOP

```

```

CLOSE_VALVE:
    MVP ABS, 0, 0
    JA LOOP

```

```

STOPMOTOR:
    MST 0
    JA LOOP

```

Left and Right Limit Switches

//TMCL Sample Setup Program. If no limit switches are tied to ground, no motion will occur.
//If the left limit switch is tied to ground, it will rotate left until the left limit switch goes high.
//If the right limit switch is tied to ground, it will rotate right until it goes high.

```

//Parameters
StallValue = 0           //StallGuard Threshold (0 = off)
Velocity = 2047         //Max Velocity
Acceleration = 1000     //Max Acceleration
ustep = 1               //4 = 16X u-stepping
pdiv = 8                //pdiv @ default
rdiv = 8                //rdiv
current = 600           //600 mA Peak
Hcurrent = 300          //300 mA Peak
decay = 2048            //2048 = on, 0 = off

//Connect a 3 position switch such that the Left Limit switch (Pin 1) is connected to one side
//of the switch, the Right Limit switch (Pin2) is connect to the other side of the switch,
//and Ground (Pin 3) is in the middle position of the switch.

//Initialization of above parameters
SAP 24, 0, decel        //Set deceleration
SAP 6, 0, current       //Setting Current
SAP 203, 0, decay       //Switch Mixed Decay
SAP 5, 0, Acceleration //Setting max acceleration
SAP 205, 0, StallValue //Setting StallGuard Threshold
SAP 140, 0, ustep       //Setting u-stepping
SAP 143, 0, Hcurrent    //Max Hold Current
SAP 154, 0, pdiv        //Initializing pdiv
SAP 4, 0, Velocity      //Setting maximum Velocity
SAP 12, 0, 1            //activate right switch
SAP 13, 0, 1            //activate left switch

Loop:
CSUB CheckLeftLim      //Call subroutine
CSUB CheckRightLim     //Call subroutine
JA Loop
STOP

CheckLeftLim:
GAP 11, 0              //Get status of Left Limit switch
COMP 0
JC EQ, GoMotorLeft     //If equal to zero, rotate
COMP 1
JC EQ, StopMotor       //If equal to one, stop motor
RSUB

CheckRightLim:
GAP 10, 0
COMP 0
JC EQ, GoMotorRight    //If equal to zero, rotate
COMP 1
JC EQ, StopMotor       //If equal to one, stop motor
RSUB

StopMotor:
MST 0
RSUB

GoMotorRight:
ROR 0, 1000
JA CheckRightLim

GoMotorLeft:
ROL 0, 1000
JA CheckLeftLim

```