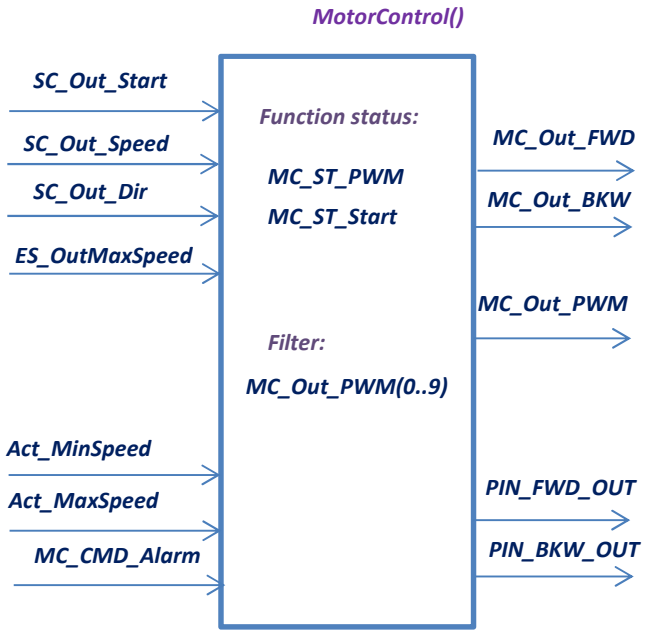
Motor control function V. 1.0

Descriptions

This function controls the output motor commands. They are two relays command and the PWM output that drives the motor power MOSFET.
The relays are used to switch the polarity supply for the motor depending by direction active.
The MOSFET driven by PWM signal acts as a voltage regulator to obtain a simple open loop speed regulator.
The real motor speed is affected by the load applied to the actuator. A speed feedback may be implemented but at very low frequency or at low resolution, due to low resolution of the hall sensors of the actuator.
The function contains also a simple digital filter on the PWM command signal to limit the high variations of the motor speed.

Syntax:	*MotorControl()*
Input parameters:	*SC_Out_Start, SC_Out_Speed, SC_Out_Dir, ES_OutMaxSpeed, Act_MinSpeed, Act_MaxSpeed, MC_CMD_Alarm.*
Output parameters:	*MC_Out_FWD, MC_Out_BKW, MC_Out_PWM, PIN_FWD_OUT, PIN_BKW_OUT*
Status:	*MC_ST_Start, MC_ST_PWM*
Calls:	

Motor Control function




```
void MotorControl()
{
 if (MC_ST_PWM) { MC_Out_PWM = ES_OutMaxSpeed;}  // If status PWM is true active output PWM command
 else        {MC_Out_PWM = 0;}

 if (MC_ST_Start)   // If status Start is true test for speed less then minimun speed
   {
    if (SC_Out_Speed <= Act_MinSpeed)
      { MC_ST_Start = false; MC_Out_FWD = false; MC_Out_BKW = false; MC_ST_PWM = false; MC_Out_PWM = 0;}
   }
 else           // If status Start is false test for start command
   {
    if (SC_Out_Start) { MC_ST_Start = true;}
    if (MC_ST_Start && !SC_Out_Dir) { MC_Out_FWD = true; MC_Out_BKW = false; MC_ST_PWM = true;}
    if (MC_ST_Start && SC_Out_Dir) { MC_Out_FWD = false; MC_Out_BKW = true; MC_ST_PWM = true;}
   }

 digitalWrite(PIN_FWD_OUT,MC_Out_FWD);  // Update outputs command relais
 digitalWrite(PIN_BKW_OUT,MC_Out_BKW);

    // Digital filtering of the  PWM command

  MC_Out_PWM9 = MC_Out_PWM8; MC_Out_PWM0 = MC_Out_PWM9;
  MC_Out_PWM8 = MC_Out_PWM7; MC_Out_PWM0 = MC_Out_PWM8 + MC_Out_PWM0;
  MC_Out_PWM7 = MC_Out_PWM6; MC_Out_PWM0 = MC_Out_PWM7 + MC_Out_PWM0;
  MC_Out_PWM6 = MC_Out_PWM5; MC_Out_PWM0 = MC_Out_PWM6 + MC_Out_PWM0;
  MC_Out_PWM5 = MC_Out_PWM4; MC_Out_PWM0 = MC_Out_PWM5 + MC_Out_PWM0;
  MC_Out_PWM4 = MC_Out_PWM3; MC_Out_PWM0 = MC_Out_PWM4 + MC_Out_PWM0;
  MC_Out_PWM3 = MC_Out_PWM2; MC_Out_PWM0 = MC_Out_PWM3 + MC_Out_PWM0;
  MC_Out_PWM2 = MC_Out_PWM1; MC_Out_PWM0 = MC_Out_PWM2 + MC_Out_PWM0;
  MC_Out_PWM1 = MC_Out_PWM;  MC_Out_PWM0 = MC_Out_PWM1 + MC_Out_PWM0;
  MC_Out_PWM = (MC_Out_PWM + MC_Out_PWM0)/10;

  MC_Out_PWM = constrain (MC_Out_PWM, 0, Act_MaxSpeed);

 // If MC_Alarm is true then it resets all output commands
 if (MC_CMD_Alarm) { MC_Out_PWM = 0; MC_Out_FWD = false; MC_Out_BKW = false; MC_ST_PWM = false;}
}
```

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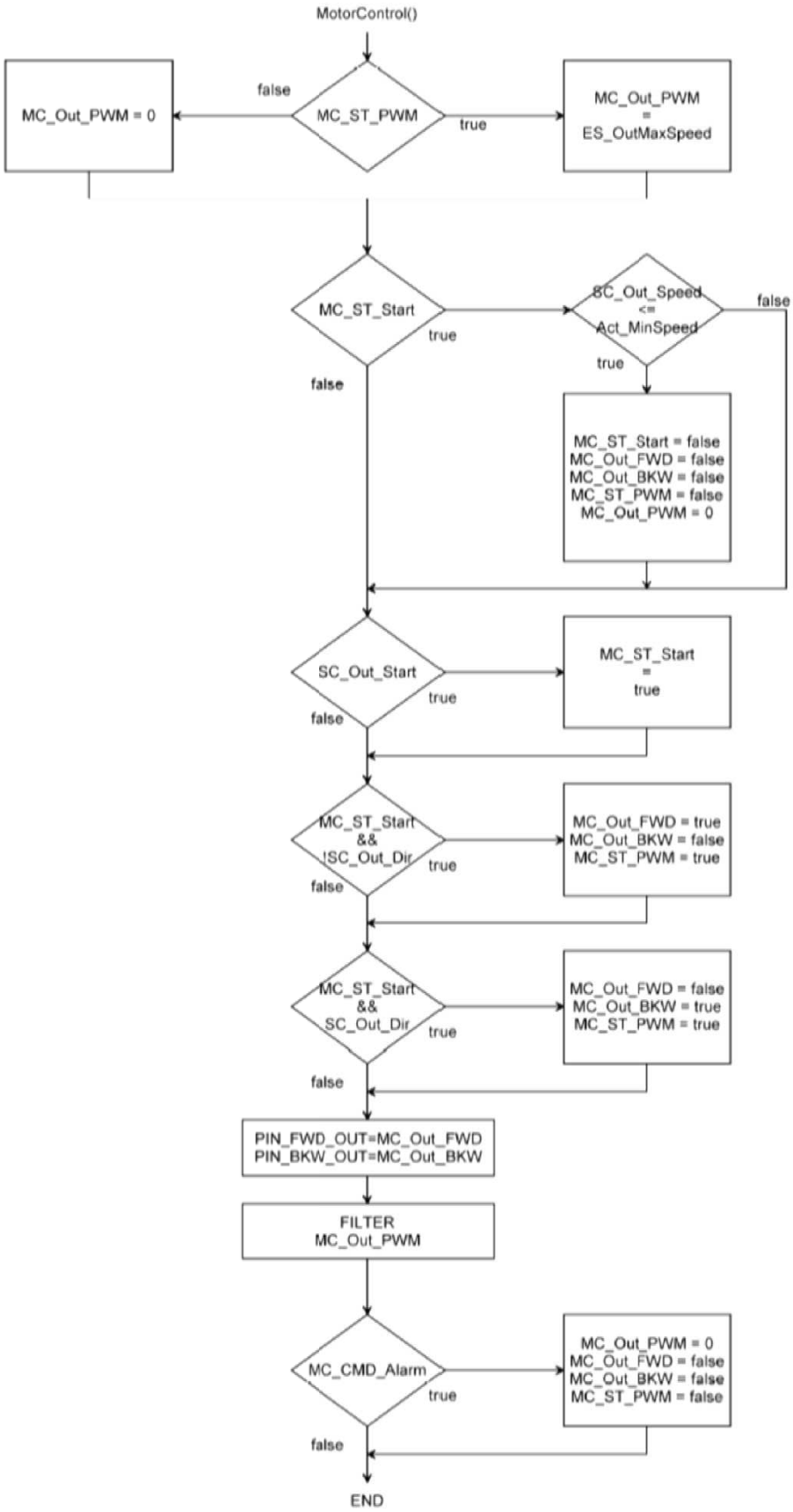
MotorControl()
MC_ST_PWM
false
true
MC_Out_PWM = 0
MC_Out_PWM = ES_OutMaxSpeed
MC_ST_Start
true
false
SC_Out_Speed <= Act_MinSpeed
true
false
MC_ST_Start = false
MC_Out_FWD = false
MC_Out_BKW = false
MC_ST_PWM = false
MC_Out_PWM = 0
SC_Out_Start
true
false
MC_ST_Start = true
MC_ST_Start && !SC_Out_Dir
true
false
MC_Out_FWD = true
MC_Out_BKW = false
MC_ST_PWM = true
MC_ST_Start && SC_Out_Dir
true
false
MC_Out_FWD = false
MC_Out_BKW = true
MC_ST_PWM = true
PIN_FWD_OUT=MC_Out_FWD
PIN_BKW_OUT=MC_Out_BKW
FILTER MC_Out_PWM
MC_CMD_Alarm
true
false
MC_Out_PWM = 0
MC_Out_FWD = false
MC_Out_BKW = false
MC_ST_PWM = false
END