

Controlling a Motor's Speed and Position

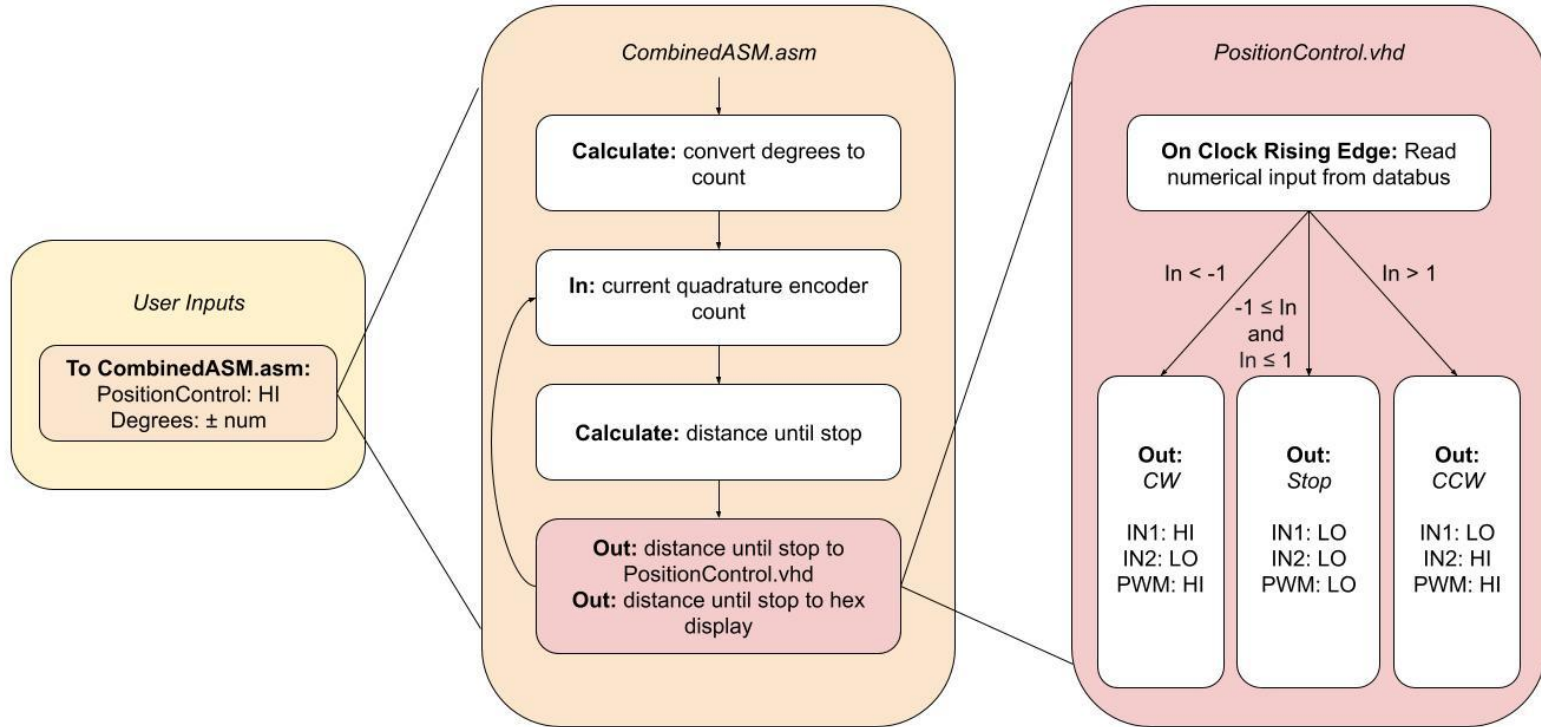
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Allowing End-User to Control a Motor

- Goals:
 - Controlling motor position.
 - 16 degree resolution.
 - 8 degrees accuracy.
 - Controlling motor speed.
 - 1 rpm resolution.
 - 5 rpm accuracy.
- User interface
 - SCOMP communications with peripherals.
 - Currently, ASM file.



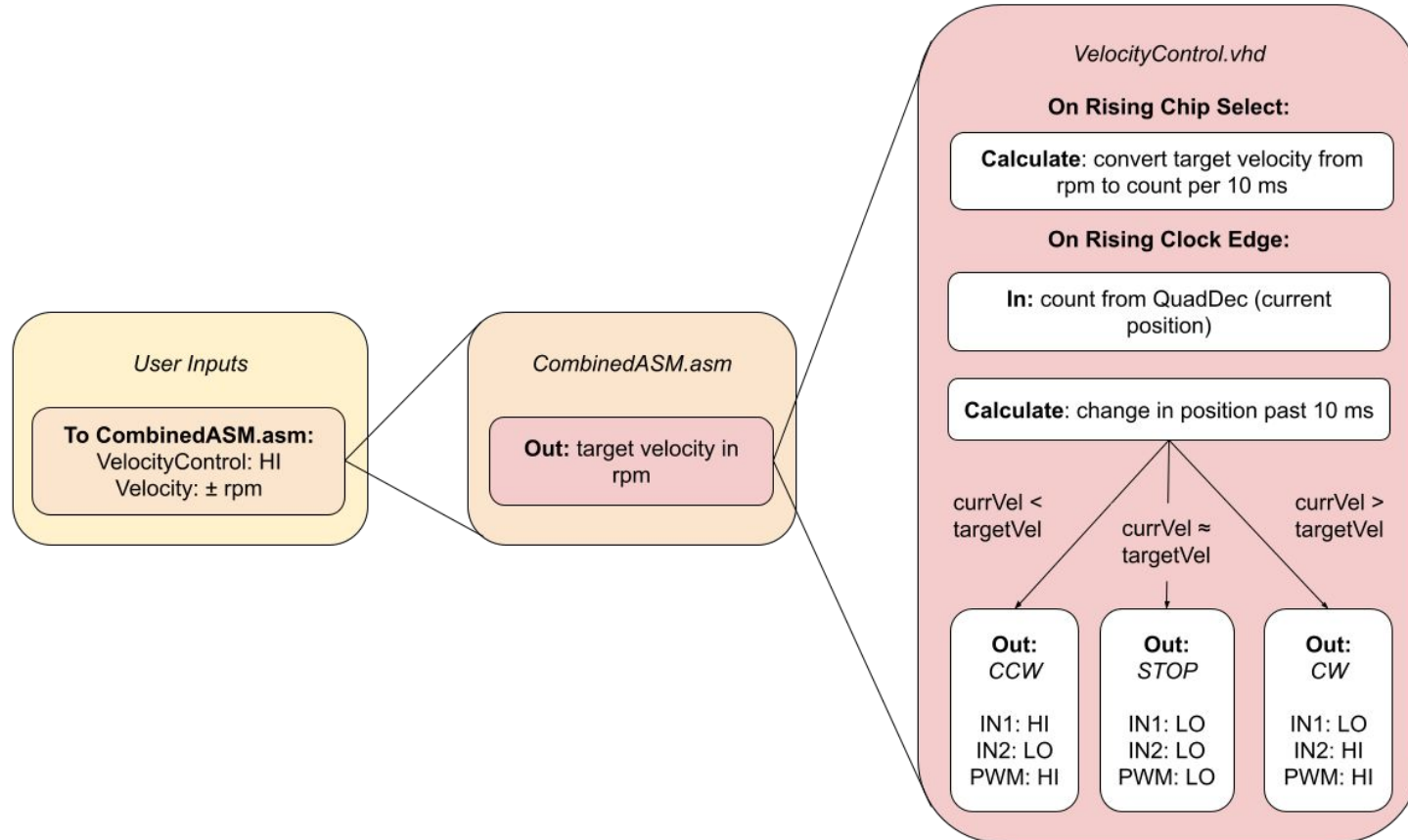
Overview of Position Control



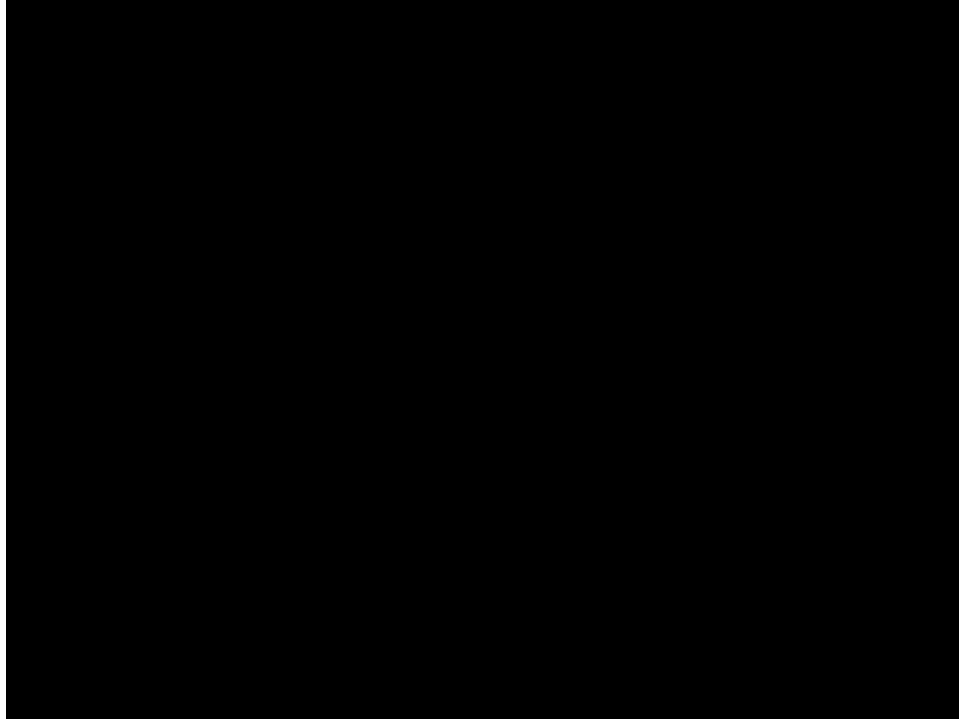
Example of Controlling Position

```
8      IN      Quad      ;Primary fu
9      OUT     Hex0
10     SUB     Encoding
11     OUT     Dir        ;If the Degr
12     OUT     Hex1       ;This place
13     never greater,
14     JUMP    Start      ;REPEAT the
15
16 ; Takes a degree value and transforms it
17 ; This process essentially takes a number
18 ToEncoding:
19     LOAD     Degrees
20     ADD      Degrees
21     ADD      Degrees
22     SHIFT    -1
23     STORE    Encoding
24     RETURN
25
26
27 ; Variables
28 Degrees:    DW 1080 ;negative = CW, positive
29 Encoding:    DW 0
30
31 ; Useful values
32 PWMHigh:    DW &H000F
33
34 ; IO address constants
35
Assembly language source file
Type here to search
```

Overview of Velocity Control



Example of Controlling Velocity



Schedule

				First Week								Second Week							Third Week							Fourth Week											
				29	30	31	1	2	3	4		5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25			
TASK	Progress	START	END	M	T	W	T	F	S	S		M	T	W	T	F	S	S		M	T	W	T	F	S	S		M	T	W	T	F	S	S			
First Phase																																					
First Meeting (Brainstorming)	100%	29-Mar-21	29-Mar-21																																		
Creating Proposal Presentation	100%	30-Mar-21	2-Apr-21																																		
Speed Peripheral for SCOMP	90%	30-Mar-21	3-Apr-21																																		
Position Peripheral for SCOMP	100%	30-Mar-21	2-Apr-21																																		
Second Phase																																					
Second Meeting (Presentation Practice)	0%	4-Apr-21	4-Apr-21																																		
Proposal Presentation	0%	4-Apr-21	4-Apr-21																																		
Correcting Problems with Peripherals	20%	4-Apr-21	4-Apr-21																																		
Third Phase																																					
Third Meeting (Schedule Revision/Add Ons)	0%	5-Apr-21	6-Apr-21																																		
Improving User's Interface	0%	5-Apr-21	11-Apr-21																																		
Controlling Direction and Speed Simultaneously	0%	11-Apr-21	17-Apr-21																																		
Fourth Phase																																					
Fourth Meeting (Demo Idea/Demo Presentation)	0%	18-Apr-21	19-Apr-21																																		
Final Product (with all working parts/peripherals)	0%	17-Apr-21	19-Apr-21																																		
Final Demo	0%	20-Apr-21	22-Apr-21																																		

Moving Forward

- Improving user-interface.
 - Switch, Push-Buttons on DE-10.
 - Binary
 - HEX1, HEX0.
 - Demo in real-time is easier.
- Control of both velocity and position.
- Division of labor.
 - Position peripheral progressive implementation.
 - Velocity peripheral progressive implementation.
 - Simultaneous control of both.
- Contingency plan.