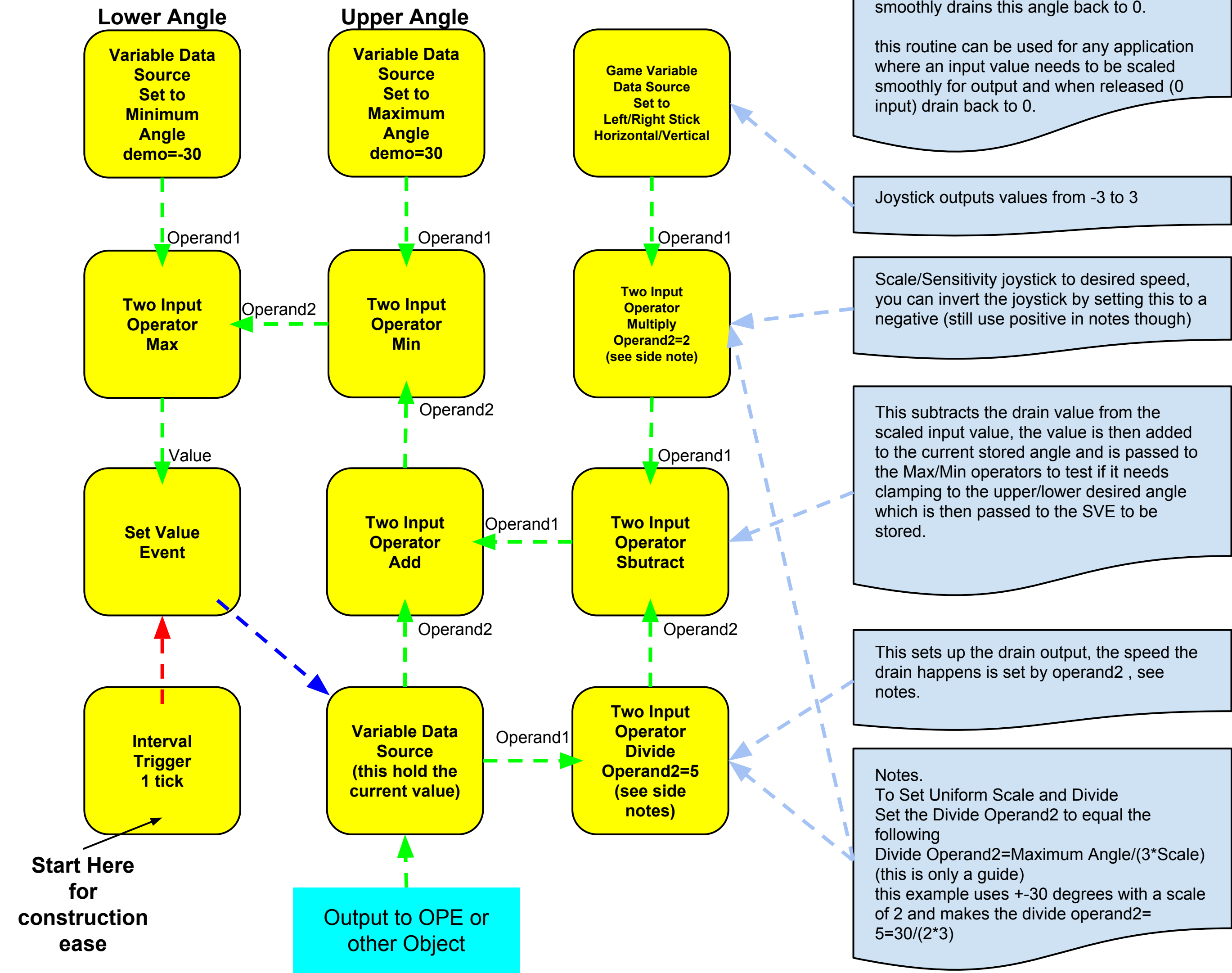


# Smooth Joystick with Automatic Self Centering



What this does:  
this creates a smooth output angle from zero degrees to the upper/lower set angle values and is based on the amount of joystick movement in the selected axis (horizontal or vertical) and when the joystick is released it smoothly drains this angle back to 0.

this routine can be used for any application where an input value needs to be scaled smoothly for output and when released (0 input) drain back to 0.

Joystick outputs values from -3 to 3

Scale/Sensitivity joystick to desired speed, you can invert the joystick by setting this to a negative (still use positive in notes though)

This subtracts the drain value from the scaled input value, the value is then added to the current stored angle and is passed to the Max/Min operators to test if it needs clamping to the upper/lower desired angle which is then passed to the SVE to be stored.

This sets up the drain output, the speed the drain happens is set by operand2 , see notes.

Notes.  
To Set Uniform Scale and Divide  
Set the Divide Operand2 to equal the following  
 $\text{Divide Operand2} = \frac{\text{Maximum Angle}}{(3 * \text{Scale})}$   
(this is only a guide)  
this example uses +-30 degrees with a scale of 2 and makes the divide operand2=  $5 = \frac{30}{(2 * 3)}$

How this works, some basic maths

i'll assume the joystick is outputting the scaled values +- 2,4,6  
so  
if i hold the joystick so its constantly adding 2 to the VDS (Variable Data Source), when the VDS hits 10 this causes the subtraction to =0 and nothing gets added to the VDS as  $10/5=2$  and  $2-2=0$  so the angle holds at 10

now if i shift the stick so its outputting 4, when the VDS hits 20, again the subtraction =0 because  $20/5=4$  leading to the subtraction  $4-4=0$  adding nothing to the VDS so it holds at 20

again if the stick is outputting 6, the VDS would have to reach 30 before nothing gets added, again  $30/5=6$  ... you get my point,

interestingly when the VDS is at 30 and you move the stick to -6 because the subtraction becomes  $-6-6=-12$  its like it has extra acceleration to swing the VDS to -30

this is what i mean when i mention uniform scale/divide, if you match the formula you get an even distribution across the whole range of angles.

the  $5 = \frac{30}{(2 * 3)}$  is so the above works correctly, the 3 is the joystick highest output and the 2 is its scale, another would be  $8 = \frac{48}{(2 * 3)}$  for +- 48 degrees.