

Below table shows the different Simulink blocks and it's representation in dafny with the help of transformation rules we have defined along with it's verification metrics:

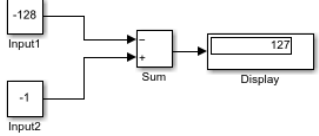
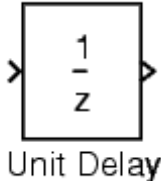
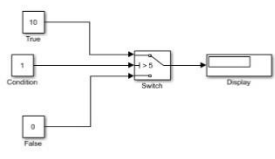

Simulink blocks	Graphical representation of Simulink blocks	Dafny representation
Sum block		<pre> method sum(input1: int, input2: int) returns (output: int) //define pre-conditions if required Ensures output==input1+input2 { output:= input1+input2; } </pre>
Unit delay block		<pre> method unitDelay(input: int) returns (output: int) { var state_unitdelay: int; state_unitdelay:= 0; var i: int; i:= 0; output:= input while(i< 10) { i:= i+1; } state_unitdelay:= input } </pre>
Switch block		<pre> method switch_block(in1: int, in2: int, cond_var: int) returns(out: int) //define pre-conditions if required ensures (out==in1 && cond_var>5) (out==in2 && cond_var<=5) { if(cond_var>5) { out:= in1; } else{ out:=in2; } } </pre>
Sine wave		<pre> method sinewave(amp: real, bias: real) { var sin: real; assume (sin >= -1.0 *(amp + bias) && sin <= 1.0*(amp+bias)); } </pre>

Table 2 Simulink block and it's representation in Dafny

