

EXTENDS *Integers, Sequences*

*BC* is a sequence of blinker configurations - in this case just a natural number signifying the blink period in some time unit

CONSTANT *BC*

VARIABLES *bState*

ASSUME  $\wedge BC \in Seq(Nat)$

*vars*  $\triangleq$  *bState*

*States*  $\triangleq$  { "Active\_Off", "Active\_On" }

*Blinker*  $\triangleq$  [*timer* : *Nat*, *state* : *States*]

*TypeOK*  $\triangleq$   $\wedge bState \in [DOMAIN\ BC \rightarrow Blinker]$

*Init*  $\triangleq$

$\wedge bState = [n \in DOMAIN\ BC \mapsto [timer \mapsto BC[n],$   
*state*  $\mapsto$  "Active\_Off"]  
]

*Transition*(*n*)  $\triangleq$   $\wedge bState[n].timer = 0$

$\wedge bState[n].state = \text{"Active\_Off"}$

$\wedge bState' = [bState\ EXCEPT\ ![n].timer = BC[n],$   
 $![n].state = \text{"Active\_On"}]$

$\vee$

$\wedge bState[n].timer = 0$

$\wedge bState[n].state = \text{"Active\_On"}$

$\wedge bState' = [bState\ EXCEPT\ ![n].timer = BC[n],$   
 $![n].state = \text{"Active\_Off"}]$

*Tick*  $\triangleq$   $\wedge \forall n \in DOMAIN\ BC : bState[n].timer > 0$

$\wedge bState' = [n \in DOMAIN\ BC \mapsto [timer \mapsto bState[n].timer - 1,$   
*state*  $\mapsto bState[n].state]]$

*Next*  $\triangleq$  *Tick*  $\vee \exists n \in DOMAIN\ BC : Transition(n)$

*Spec*  $\triangleq$  *Init*  $\wedge \Box [Next]_{vars}$

*FairSpec*  $\triangleq$  *Spec*  $\wedge WF_{vars}(Next)$

*LEDsWillTurnOn*  $\triangleq$

$\forall n \in DOMAIN\ BC :$   
 $(bState[n].state = \text{"Active\_Off"}) \rightsquigarrow (bState[n].state = \text{"Active\_On"})$

*LEDsWillTurnOff*  $\triangleq$

$\forall n \in DOMAIN\ BC :$   
 $(bState[n].state = \text{"Active\_On"}) \rightsquigarrow (bState[n].state = \text{"Active\_Off"})$

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