$\overline{\phantom{xxxxxxxxxxxx}}$ MODULE $AsynchInterface$ $\overline{\phantom{xxxxxxxxxxxx}}$

EXTENDS $Naturals$
CONSTANT $Data$
VARIABLES $val,\ rdy,\ ack$
$TypeInvariant \;\triangleq\; \land\ val\ \in Data$
$\qquad\qquad\qquad\quad \land\ rdy\ \in \{0,\,1\}$
$\qquad\qquad\qquad\quad \land\ ack \in \{0,\,1\}$

---

$Init \;\;\triangleq\; \land\ val\ \in Data$
$\qquad\quad \land\ rdy\ \in \{0,\,1\}$
$\qquad\quad \land\ ack = rdy$

$Send \;\triangleq\; \land\ rdy = ack$
$\qquad\quad \land\ val'\ \in Data$
$\qquad\quad \land\ rdy' = 1 - rdy$
$\qquad\quad \land\ \text{UNCHANGED } ack$

$Rcv \;\triangleq\; \land\ rdy \neq ack$
$\qquad\quad \land\ ack' = 1 - ack$
$\qquad\quad \land\ \text{UNCHANGED }\langle val,\ rdy\rangle$

$Next \;\triangleq\; Send \lor Rcv$
$Spec \;\;\triangleq\; Init \land \Box[Next]_{\langle val,\,rdy,\,ack\rangle}$

---

THEOREM $Spec \Rightarrow \Box TypeInvariant$
$\phantom{x}$