LogiSwitch NoBounce Handshake Protocol for Ultra-Fast/Ultra-Simple Coding

The LogiSwitch NoBounce™ switches and the LS100 Series of debounce ICs provide an exclusive feature that dramatically speeds up switch service transactions and completely eliminate the necessity of polling for switch release to terminate the cycle.

An active-high output from the LogiSwitch device signals the activation of a switch to the host computer to start a cycle. When the host computer recognizes the signal, it issues an active-low “handshake” pulse on the line. The LogiSwitch device sees the handshake as an acknowledgement and drives the line low to terminate the switch service cycle.

Only the switch service routine can determine the exact appropriate moment to terminate the cycle because it is no longer needed. Typical “polled“ routines use the release of the switch to determine the end of the cycle. Note that the release of the switch may just be when someone decides to remove his finger off the switch, hardly the best indicator of the proper event to signal the end of a switch service routine.

Note that the handshake protocol is implemented with “wired-OR” signaling over the switch I/O line. This concept allows either the LogiSwitch device or the host computer to issue an active low signal over the line without conflict as follows:

1. While inactive the switch output line is in the low state.
2. When the switch is activated the LogiSwitch device releases the low level on the line. A pull-up resistor internal to the LogiSwitch device brings the line to a high level.

3. The host computer sees the high level in its main idle loop as a switch service request. It reacts by acknowledging the request with a 5 µs low-going pulse and continues on executing the request.
4. The LogiSwitch device's response to the 5 µs low-going acknowledgement is to drive the line low to terminate the cycle. The cycle is now ended exactly the same as if the system had waited for the release of the switch. The fact that the actual switch remains actuated has no bearing on the service routine; it must be released before a new switch service cycle can begin anyhow. Note that the LogiSwitch device continues to monitor the state of the switch after it has virtually terminated the present cycle to assure that the switch bounce on release will be internally debounced and a new cycle may be allowed to begin.

All embedded processors incorporate the ability to programmatically set the mode of its pins as inputs or outputs. The LogiSwitch handshake requires the host computer to read the line when in input mode and switch to output mode to issue the active-low acknowledgement handshake.

As shown above, the LogiSwitch handshake protocol included with all LogiSwitch NoBounce switch products and all LS100 Debounce ICs, provides a simple means to greatly enhance the execution speed and simplify the coding of switch service routines.