Electronic circuit replaces mechanical push-push switch

Donald Schelle - September 28, 2006

Mechanical push-pushbutton switches (also known as alternate-action or push-on/push-off switches) can be bulky and expensive. As an alternative, an electronic version uses a cheaper, NO (normally open), momentary-on switch (Figure 1). A supervisory microprocessor, IC₁, serves as a combination switch debouncer and intelligent controller. Applying power holds IC₁'s LBC output (Pin 4) low, which in turn resets flip-flop IC₂'s output to a logic-low state (off) (Figure 2). Pressing the NO momentary-contact switch, S₁, evokes a pulse from the RESET output (IC₁, Pin 5), which triggers IC₂'s CK input (Pin 1) and toggles IC₂'s output to a logic-high state (on). Pressing the switch a second time triggers another RESET pulse that toggles flip-flop IC₂'s output to a logic-low state (off).

You can add an optional watchdog timer, IC₃, to reset IC₂'s output to the logic-low state after a user-selectable interval as long as 60 sec. You can select shorter reset times using IC₃'s programming pins: SET0, SET1, and SET2. The entire circuit costs about $2 (1000) and occupies a pc-board area that's no larger than its mechanical counterpart.