

Debounce Mechanical Switches with IMP811 μ P Supervisor

Introduction

It is often necessary to debounce a mechanical switch contact to avoid multiple entries. Push-button, membrane, and even toggle switches exhibit repetitive contact closures before finally settling to the closed state. Most switches stabilize within 75ms – some, such as membrane switches, stabilize faster. The IMP811 microprocessor supervisory circuit can debounce switch closures economically and easily.

The key to switch debouncing is the IMP811 manual reset input. Either a rising V_{CC} or a logic “0” on the IMP811 manual reset (MR) input generates a reset output signal. This reset output is a logic “0” for 140ms minimum. The reset output goes to zero when the MR input goes to zero, and stays in the “0” state for 140ms after the reset output returns to the “1” state. This means that the RESET output, shown in *Figure 1*, is a clean logic “0” pulse for a minimum period of 140ms.

For most applications, the IMP811REUS with a 2.63V reset threshold is the optimum choice. This provides the greatest noise immunity for any V_{CC} between 3V and 5V. The MR trigger threshold is $0.25V_{CC}$. The active low manual reset input is pulled-high by an internal 10k Ω pull-up resistor.

In most applications, the internal pull-up resistor is adequate for noise rejection. However, in high-noise environments, a 0.1 μ F capacitor may be added between the MR input and ground. Care must also be taken to ensure that the reset pulse due to the rise or fall of V_{CC} is masked from being interpreted as a valid switch closure.

A switch with ON resistance of 3.3k Ω or below, when connected between the MR input and ground, will trigger a reset pulse. Since membrane switches exhibit ON resistances of approximately 100 Ω , the IMP811 is an ideal debounce circuit for membrane switches.

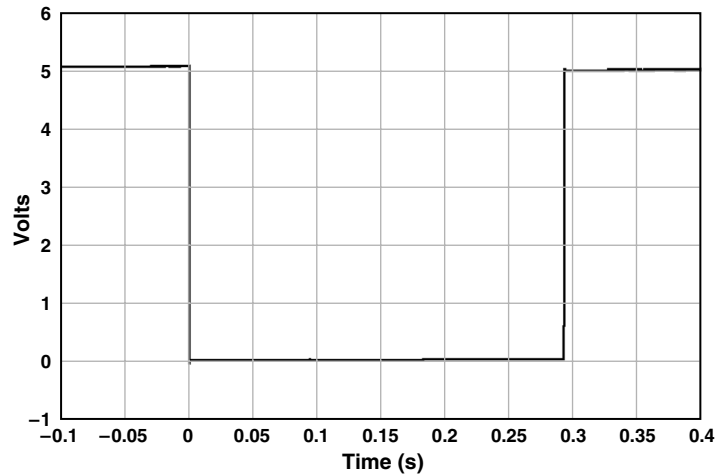


Figure 1. $\overline{\text{RESET}}$ Output

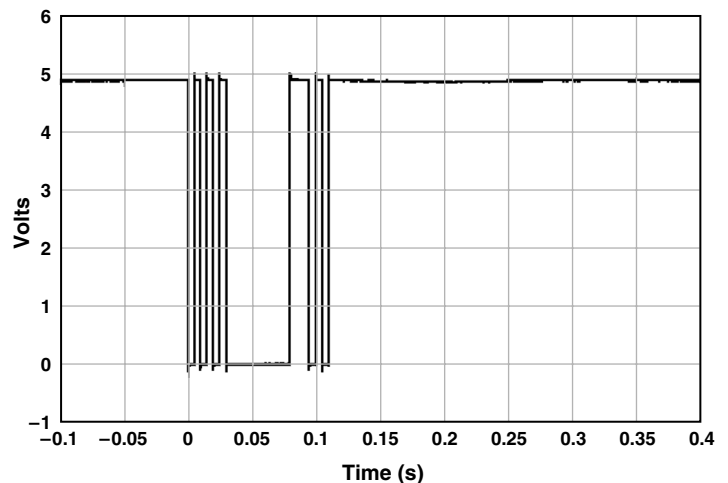


Figure 2. $\overline{\text{MR}}$ Input

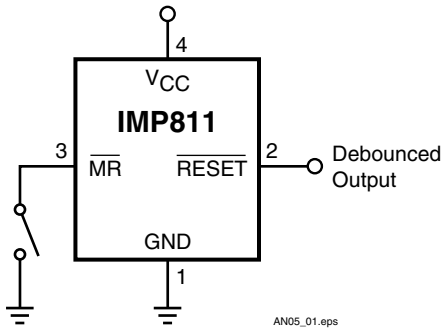


Figure 3. Switch Debounce Circuit



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