LogiSwitch NoBounce Switches with Handshake Users Guide

Overview

LogiSwitch provides a series of pushbutton and limit switches incorporating the same unique NoBounce™ adaptive debounce algorithm and handshake protocol as implemented in the LogiSwitch LS100 series line of bounce-free ICs.

All LogiSwitch switch products provide a selection of three different output formats:

1. Normally Low/Handshake (NL/HS) pin provides an active-high handshakeable output.
2. Normally High (NH) pin provides a low-impedance active-low output.
3. Toggle (TG) pin changes state each time the switch is actuated. (powers-up high)

**16 MM Vandal-Resistant Switch
with Green LED - LS16MM-G**

LogiSwitch provides three styles of switches modified with our unique immediate output and handshake protocol. The line consists of a) high end 16mm, 19mm and 22mm vandal-resistant IP67 pushbutton switches with ring LEDs, b) simple low-cost 6mm pushbutton switches with red, white or black caps, and c) low-cost subminiature limit switches in 5 lever styles.

Pin Description

Pin	Name	Function
1	Vdd	+2.3 V to +5.5 V Supply Voltage
2	NH	Normally High Output
3	NL/HS	Normally Low/Handshake I/O
4	TG	Toggle Output
5	GND	Ground

Waveforms
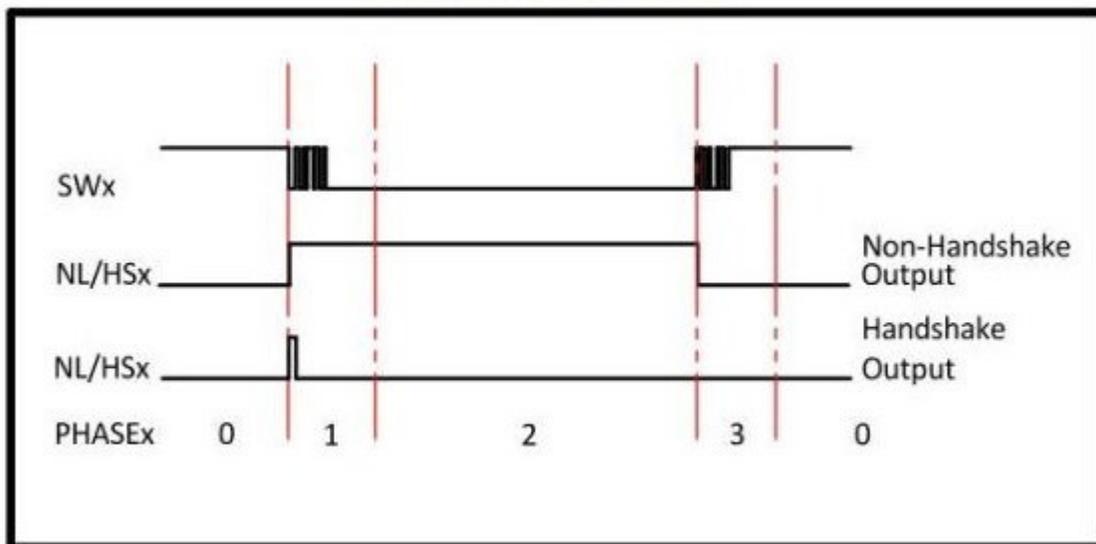
Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Operating Voltage Range	Vcc		2.5		5.5	Volts
Supply Current – LS118	Icc	Vcc = 3.0 V, All Inputs Open	-	1,000	1,500	µA
Input Pull-up Current/Pin	Ipu	LS118	25	100	200	mA
Input Pull-up Current/Pin	Ipu	LS119, LS120	25	120	200	mA
Debounce Time	tdb	Vcc = 2.5 V – 5.5V		21		ms

Test for switch a service request in the main loop. If the NL/HS line is high, the switch has become active. If not, continue with the main loop until the next time through.

Okay, it is active. To acknowledge that we have received the request, we will send a pulse back to the LogiSwitch device. First, we set the NL/HS pin to output mode, then make it low.

Now we set a 5 μs delay to allow time for the LogiSwitch device to recognize our acknowledgement.

Has the delay timed out yet?

Timeout done. Now we want to go back to input mode. The LogiSwitch device has already seen the acknowledge pulse and has latched the line out low to end the cycle without the need for release of the switch. Note that another cycle will not be initialized until the switch has been released and its output debounced.

Now we are all done with this cycle. We can execute our switch service routine and go back to executing code in the main loop. The LogiSwitch device will determine when the switch has been released and debounced, so the next switch cycle may be initiated.

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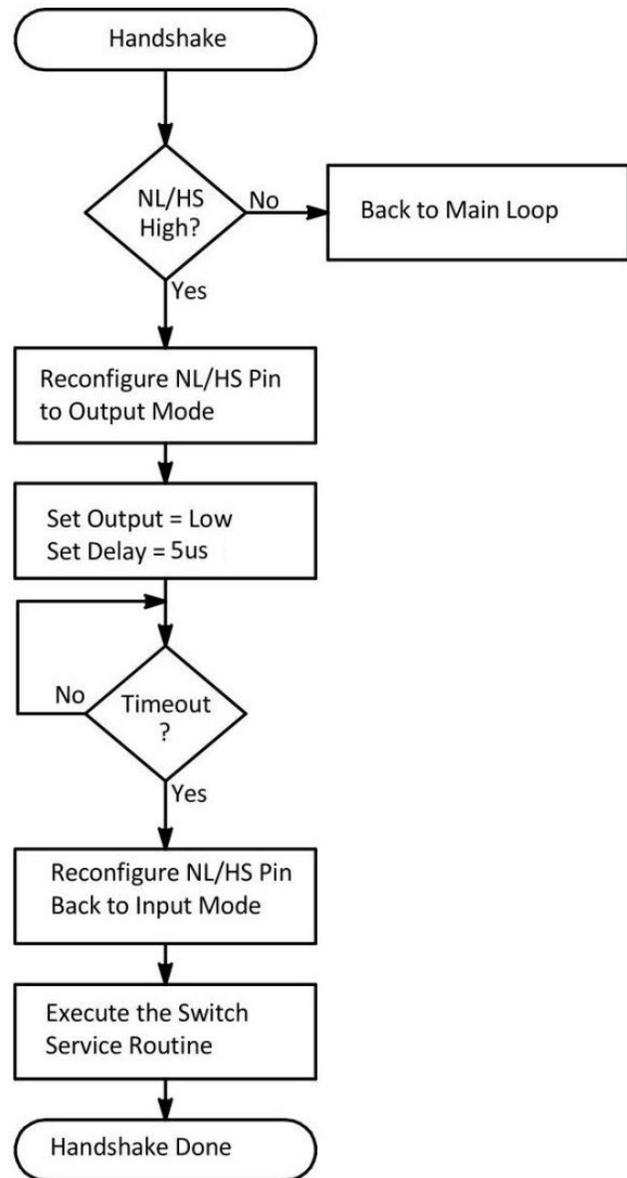
Software – Implementing the Handshake with an Arduino

The following few lines of code for an Arduino Uno demonstrate the simplicity of a host computer interface using the LogiSwitch handshake.

```
//****************************************************************************
// This code snippet for Arduino Uno demonstrates the single-pin handshake
// protocol of the LS100 Series Switch Debouncer ICs for Embedded Processors
//****************************************************************************
int NL_HS = 8;          // Define the pin(s)
void setup () {// Start with REQ_ACK configured to Input Mode
pinMode (NL_HS, INPUT);
}
//****************************************************************************
void loop() {
// Place this code at the appropriate place in the main loop...
pinMode (NL_HS, INPUT);     // Set NL/HS pin to input mode
if (digitalRead (NL_HS) == HIGH)    // Request from switch?
{
pinMode (NL_HS, OUTPUT);  // Yes, respond with handshake
digitalWrite (NL_HS,LOW);    // Acknowledge with a 5us low pulse
delayMicroseconds(5);
pinMode (NL_HS,INPUT);      // Back to input mode
delayMicroseconds(5);
// Place switch service routine or function call here...
   }
}
```

LogiSwitch

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