|  |
| --- |
| ISLAMIC UNIVERSITY OF TECHNOLOGYOrganization of Islamic CooperationBoard Bazar, Gazipur |

# Schmitt Triggers

# EEE 4483

# Safayat Bin Hakim

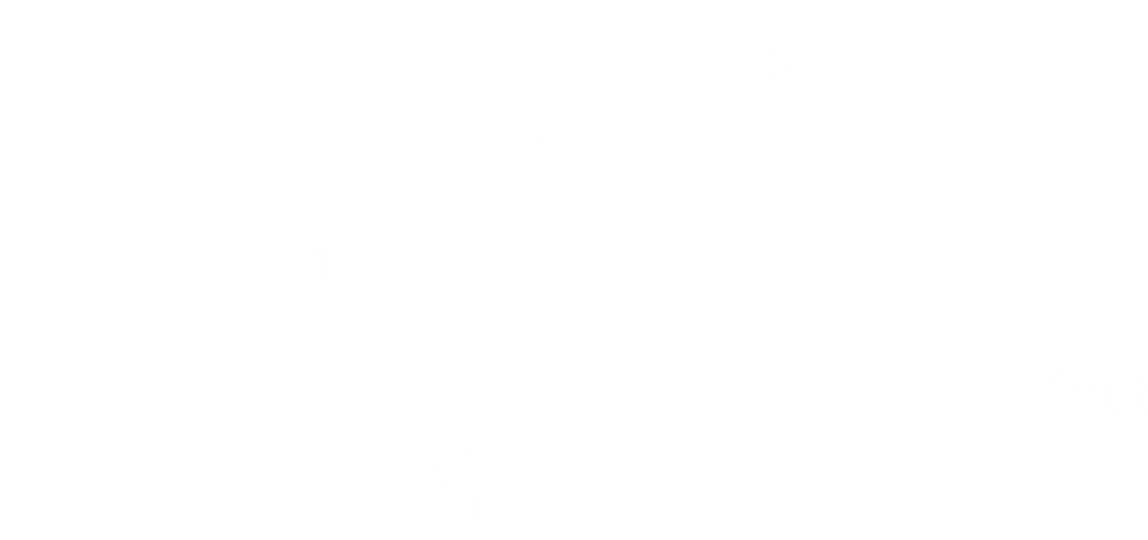
1.

A Schmitt trigger is a comparator circuit with hysteresis implemented by applying positive feedback to the non-inverting input of a comparator or differential amplifier.

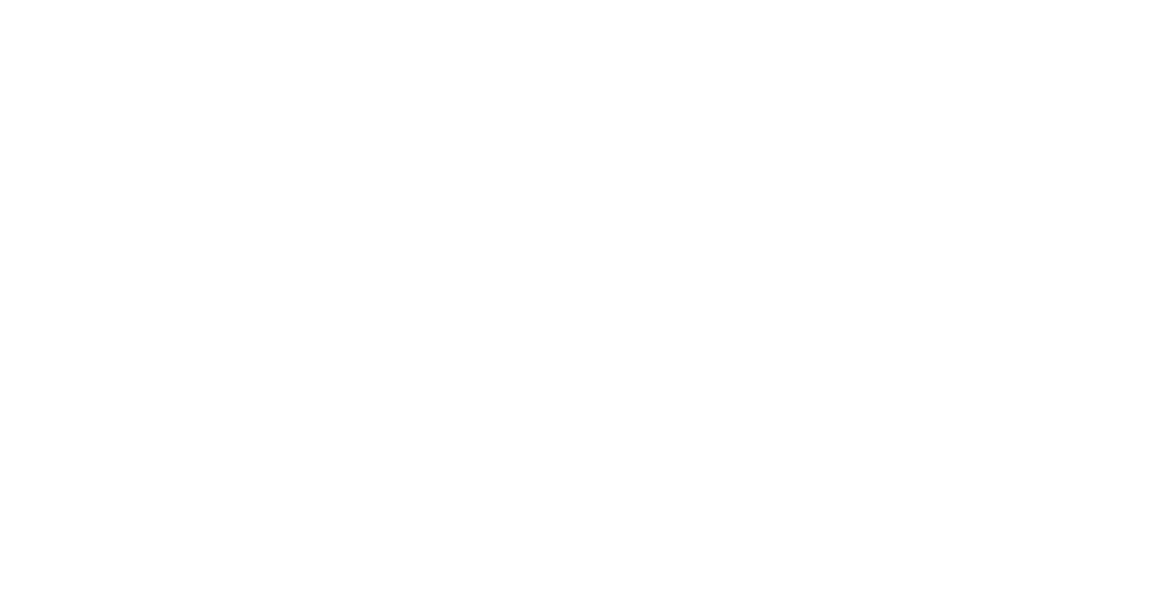
2.

Comparator circuits are pretty sensitive. If a signal is noisy, even small amounts of noise can cause problems near the trip points. The noise can cause the comparator to think that the signal has crossed the trip point. A Schmitt trigger helps avoid this problem.

3.



4.



5.

In a comparator circuit, we have a reference input and a second input that we will be comparing. The problem is that small fluctuations in noise can make it seem like our input is greater/less than the reference.

Schmitt triggers solve this. The output is taken as a positive feedback, which creates an upper and a lower threshold. Then, the input has to cross the upper threshold while rising and the lower threshold while dropping for the change to register at the output. This eliminates the effect of noise.

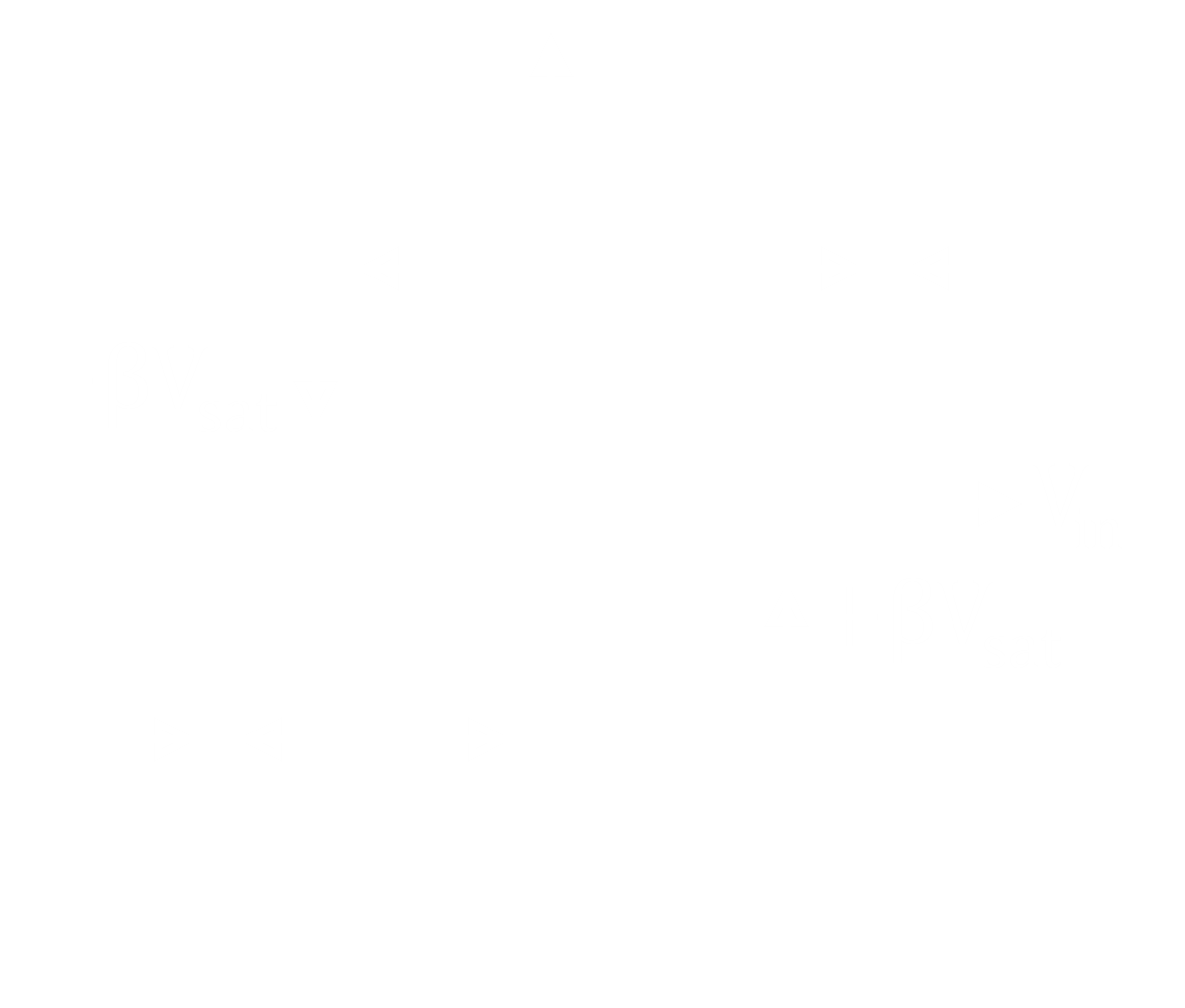
6.

UTP is the upper threshold point. It is the point at which the output changes during the phase in which the output changes during the phase in which the input is increasing for a Schmitt trigger.

LTP is the lower threshold point. It is the point at which the output changes during the phase in which the input is decreasing for a Schmitt trigger.

7.

Hysteresis is the difference between UTP and LTP.



The hysteresis loop can be shifted to either side of the zero point by consulting a voltage source.

When , UTP

When , LTP

If is positive, the loop shifts right. If it is negative, the loop shifts left. is unchanged.

8.

* For comparison of voltage levels
* Designing multivibrator or oscillator circuits
* Analogue-to-digital converters
* Waveform converters
* Switching debouncing

9.

For the triggering action, we need an inverting configuration. Let be more than the maximum noise. . This means UTP and LTP .

LTP , where and LTP .

LTP