

uebung_3.5.4

Student Group

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Exercise 3.5.4. Conversion of a unipolar signal into a bipolar signal

You work in the company “HHN Mechatronics & Robotics” and are supposed to generate a bipolar signal ($-10 \text{ V} \dots + 10 \text{ V}$) from a unipolar signal of a digital-to-analog converter ($0 \dots 5 \text{ V}$) in a project. A colleague recommended the circuit shown on the right.

1. First, analyze what change is made by pressing the switch S . How does the output signal change?
2. Try to determine mathematically the relationship of U_{O} and U_{I} as $U_{\text{O}}(U_{\text{I}})$ by superposition.
3. The circuit still has the problem that for a positive half-wave the output is still negative. Which additional circuit must be provided so that this problem can be solved?

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