

Lab 1: Resistors and Resistive Networks

ENGR 2420 | Olin College

Jasper Katzban

September 23, 2020

Postlab

We can relate the current flowing through each of the $2R$ resistors, I_n to the reference voltage, V_{ref} and the unit resistance, R . Earlier in the lab, we derived the following equation as a function of branch number, n .

$$I_n = \frac{V}{2^{n+1} \cdot R}$$

We can make this equation useful in the context of a D/A converter by reversing the order of our n s to match the way we refer to the bits in the device. Note that N is the total number of bits in the DAC.

$$I_n = \frac{V_{ref}}{2^{N-n} \cdot R}$$

We can also express the total output current, I_{out} as a function of the values of the DAC's binary digits, b_n , the reference voltage, V_{ref} and the unit resistance, R :

$$I_{out} = \sum_{n=0}^{N-1} \frac{b_n \cdot V_{ref}}{2^{N-n} \cdot R}$$