

myDAQ DC supply and multimeter report

Student name: Trinh Gia Huy

Student number: H290290

Student email: giahuy.trinh@tuni.fi

Using the analog outputs a DC voltage supply

Q: Measure the voltage between the resistor terminals. Is it the same as the Voltage Level?

A: Yes it is the same value as a voltage level (1V)

Q: Keep increasing the Voltage Level until the multimeter reading does not increase. At what Voltage Level does this happen?

A: At voltage level 2.3V the multimeter reading does not increase (measured at 2.23V)

Q> Calculate the current by using the multimeter reading and the resistor nominal value. Compare it to the maximum given in the specifications, 2 mA

The current measured by multimeter reader is 2.3mA, and it is larger than the maximum given in specifications, which is 2mA

Testing the +5 V digital supply

Q: Measure the voltage between DGND and the 5V connector. Is it +5V?

A: No it is 4.98V from the multimeter

Between 1-kOhm, the voltage is 4.8V

Solving a resistor network

Let modified the picture as below

$$R_{AD} = 1k + (10k \cdot 2k) / (10k + 2k) = 8/3 \text{ kOhm}$$

$$R = (R_5 \cdot R_{AD}) / (R_5 + R_{AD}) = 40/19 \text{ kOhm}$$

$$\text{Current through the resistor network } I = V_s / R = 7.125 \cdot 10^{-3} \text{ (A)}$$

The current through R1

$$I_1 = I - V_s / R_5 = 5.625 \cdot 10^{-3} \text{ (A)}$$

$$U_1 = I_1 \cdot R_1 = 5.625 \text{ V} = V_s - V_1$$

$$\Rightarrow V_1 = -U_1 + V_s = 9.375 \text{ (V)}$$

$$I_2 = I_1 - V_1 / R_3 = 4.6875 \cdot 10^{-3} \text{ (A)}$$

$$I_2 \cdot R_2 = 4.6875 \text{ (V)}$$

$$-V_2 + V_1 = I_2 R_2 \Rightarrow V_2 = V_1 - I_2 R_2 = 4.6875 \text{ (V)}$$

$$V_1 = 9.22\text{V}$$

$$V_2 = 4.64\text{V}$$

$$I = 0.078\text{A}$$

Thus the power dispatched by the circuit is $W = I^2 \cdot R = 0.078^2 \cdot R = 12.8 \text{ J}$

