

## myDAQ DC supply and multimeter report

**Student name:** Trinh Gia Huy

**Student number:** H290290

**Student email:** [giahuy.trinh@tuni.fi](mailto: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

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

$$R = (R5 \cdot R_{AD}) / (R5 + R_{AD}) = 40/19 \text{ kOhm}$$

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

The current through R1

$$I1 = I - V_s / R5 = 5.625 \cdot 10^{-3} \text{ (A)}$$

$$U1 = I1 \cdot R1 = 5.625 \text{ V} = V_s - V1$$

$$\Rightarrow V1 = -U1 + V_s = 9.375 \text{ (V)}$$

$$I2 = I1 - V1 / R3 = 4.6875 \cdot 10^{-3} \text{ (A)}$$

$$I2 \cdot R2 = 4.6875 \text{ (V)}$$

$$-V2 + V1 = I2 R2 \Rightarrow V2 = V1 - I2 R2 = 4.6875 \text{ (V)}$$

$$V1 = 9.22V$$

$$V2 = 4.64V$$

$$I = 0.078A$$

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