Protocol Laboratory Digital Engineering #1

Hochschule Rhein-Waal

Rhine-Waal University of Applied Sciences

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	Quang Minh, Dinh / 24211
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Course name:	Laboratory Digital Engineering
Group:	A
Faculty:	Communication and Environment
Deadline:	24.02.2019
Semester:	WS 2018/19
Supervisor:	Prof. Dr.-Ing. Christian Ressel
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Challenge #1

Study Questions

Setting up ESD equipment:

1. Take out the ESD equipment.
2. Wear the ESD wristband.
3. Connect the ESD wristband to ground via step 4.
4. Using a cable, plug the ESD wristband to the grounded socket under the table.

Multimeter:

Question #1 – What kind of indicators can be measured with a multimeter?

Voltage, Current, Resistance.

Question #2 – What has to be considered concerning the measurement range?

Type of the measurement range.

Question #3 – What is the difference between voltage and current measurement

regarding the measurement procedure?

Voltage: Switch dial to V.

Probes connected parallel to the component.

Black lead to COM.

Red lead to INPUT.

Current: Switch dial to either microA/mA/A.

Probes connected in series to the component (circuit must be broke off at point of interest).

Black lead to COM

If expect measure less than 200mA, Red lead to INPUT.

If measure more than 200mA, red lead to ~10A.

Power Supply:

Question #1 – Why is a power supply necessary?

Used to deliver DC or AC voltage

Question #2 – What types of power supplies are available?

Linear regulated power supply (DC only).

Switching power supply (both AC and DC).

Question #3 – What is the current limitation used for?

To set an upper limit of electrical current delivered.

Clear overload conditions/ Short circuit.

Challenge #2

Abstract:

We begin with following the Description steps until step 7. Then we plug the measurement pipes into the power supply and approximate the knobs to the value needed. After that we take the measurement pipes and touch their tips together to get the value of current. Finally, we make final adjustments to the knobs to get the desired value.

Pictures:


Volt
MASTER
Ampere
20.0
Output 1
0.00
TRIPLE POWER SUPPLY
Volt
SLAVE
Ampere
00.0
Output 2
0.20
EA-PS2332-025
Series Normal Parallel
Power
Voltage 0...32V
Current 0...2.5A
Output 1
Output 2
Studierendenausweis
Student ID-Card
HOCHSCHULE RHEIN-WAAL
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Fachsemester: – – Angestrebter Abschluss: – –
Freie Fahrt in der VRR-Prst.D (Nord)/im NRW-Nahverkehr


Volt
MASTER
Ampere
00.0
Output 1
0.10
TRIPLE POWER SUPPLY
Volt
SLAVE
Ampere
Output 2
EA-PS2332-025
Series Normal Parallel
Power
Voltage 0...32V
Current 0...2.5A
Output 1
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Studiengang: Vorbereitungskurs

Challenge #3

Abstract:

Our group managed to follow the steps given in the Description and completed the challenge without anything special to report.

Pictures:

Result:

Output of Power Supply	Measured Voltage [V]
Left Output	19.97
Right Output	12.02
Fixed Output	5.02

Challenge #4

Abstract:

Our group managed to follow the steps given in the Description and completed the challenge without anything special to report.

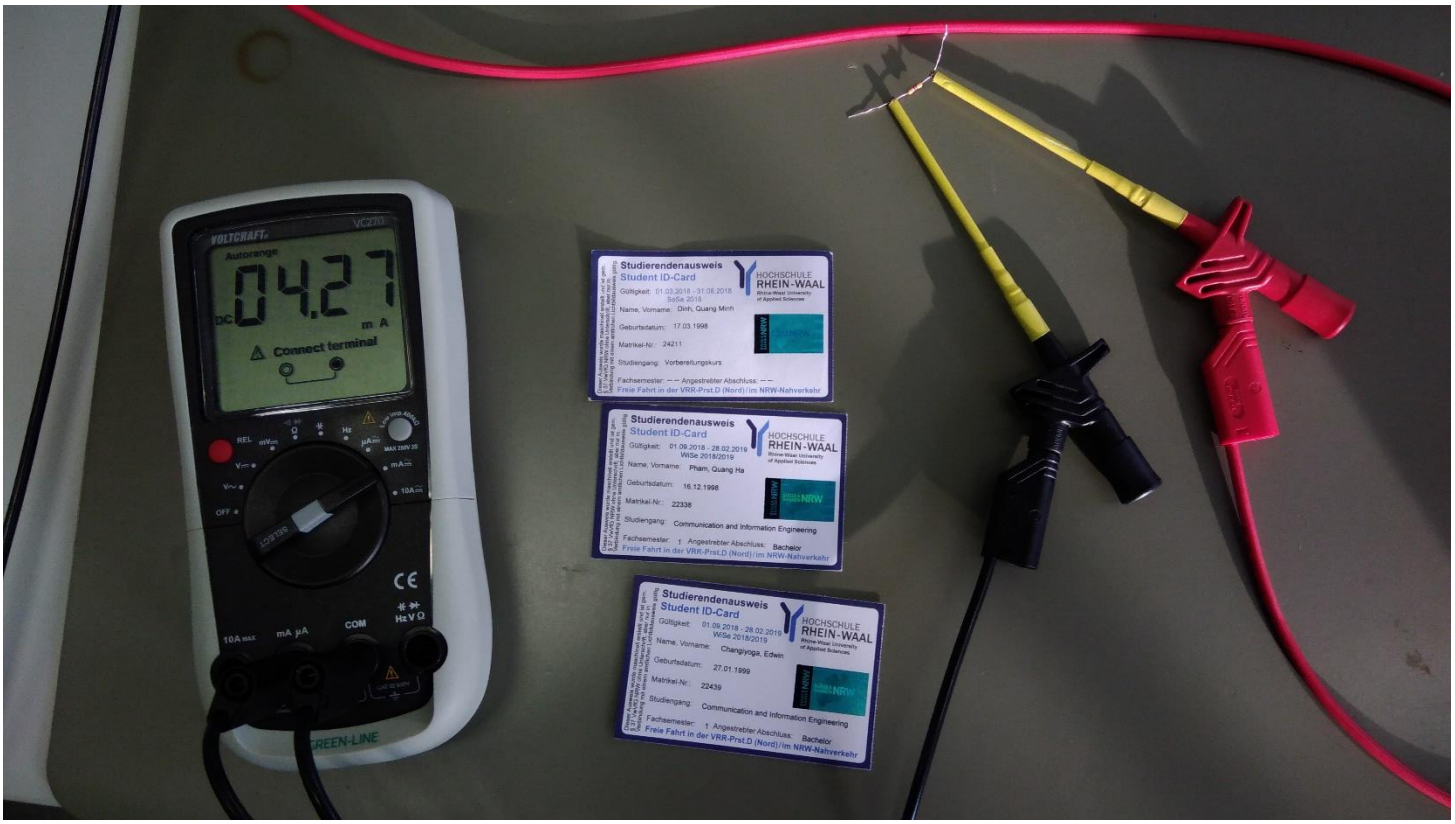
Pictures:

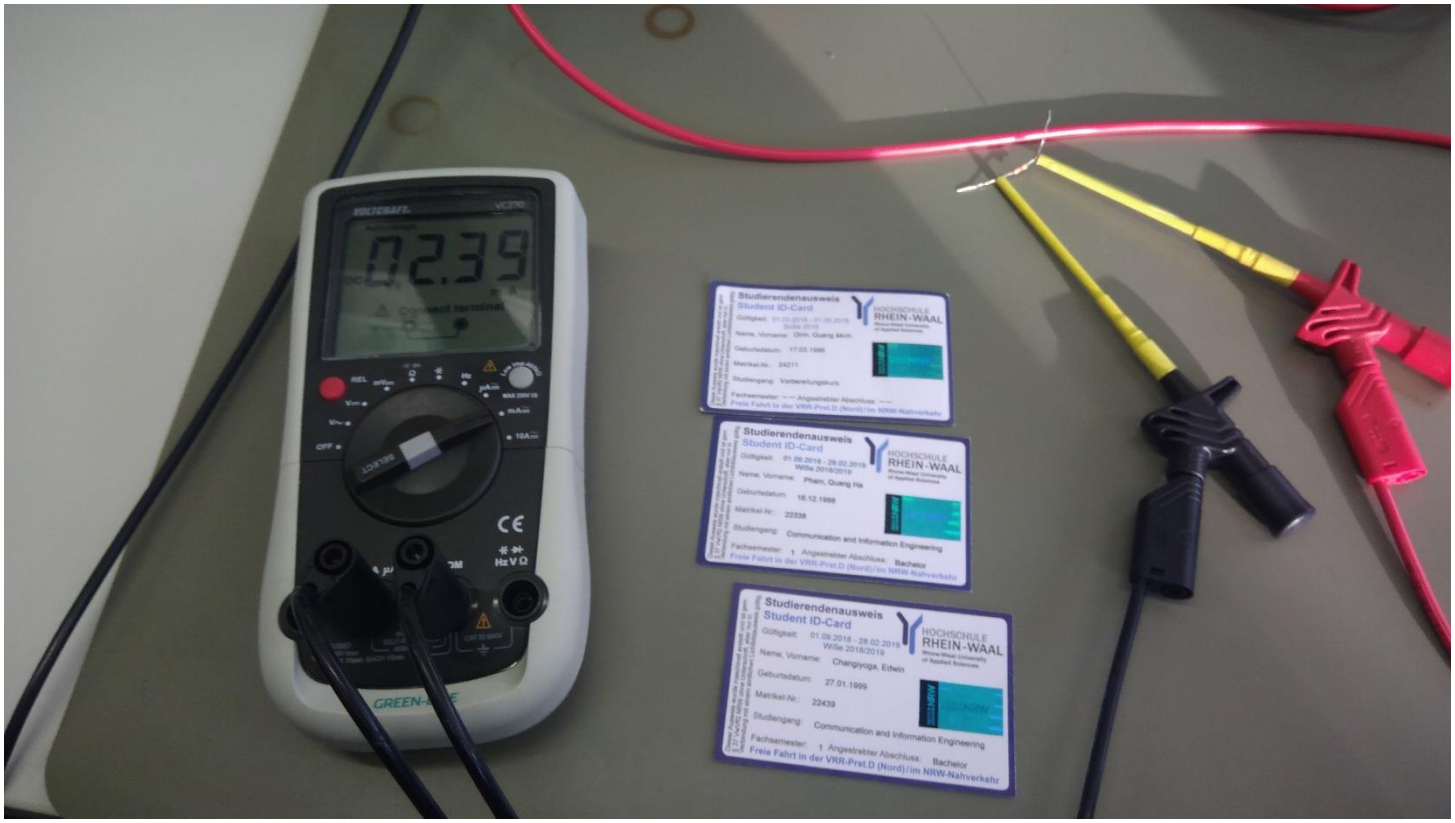
Challenge #5

Abstract:

Our group managed to follow the steps given in the Description and completed the challenge without anything special to report.

Pictures:




VOLTCRAFT
VC270
Studierendenausweis
Student ID-Card
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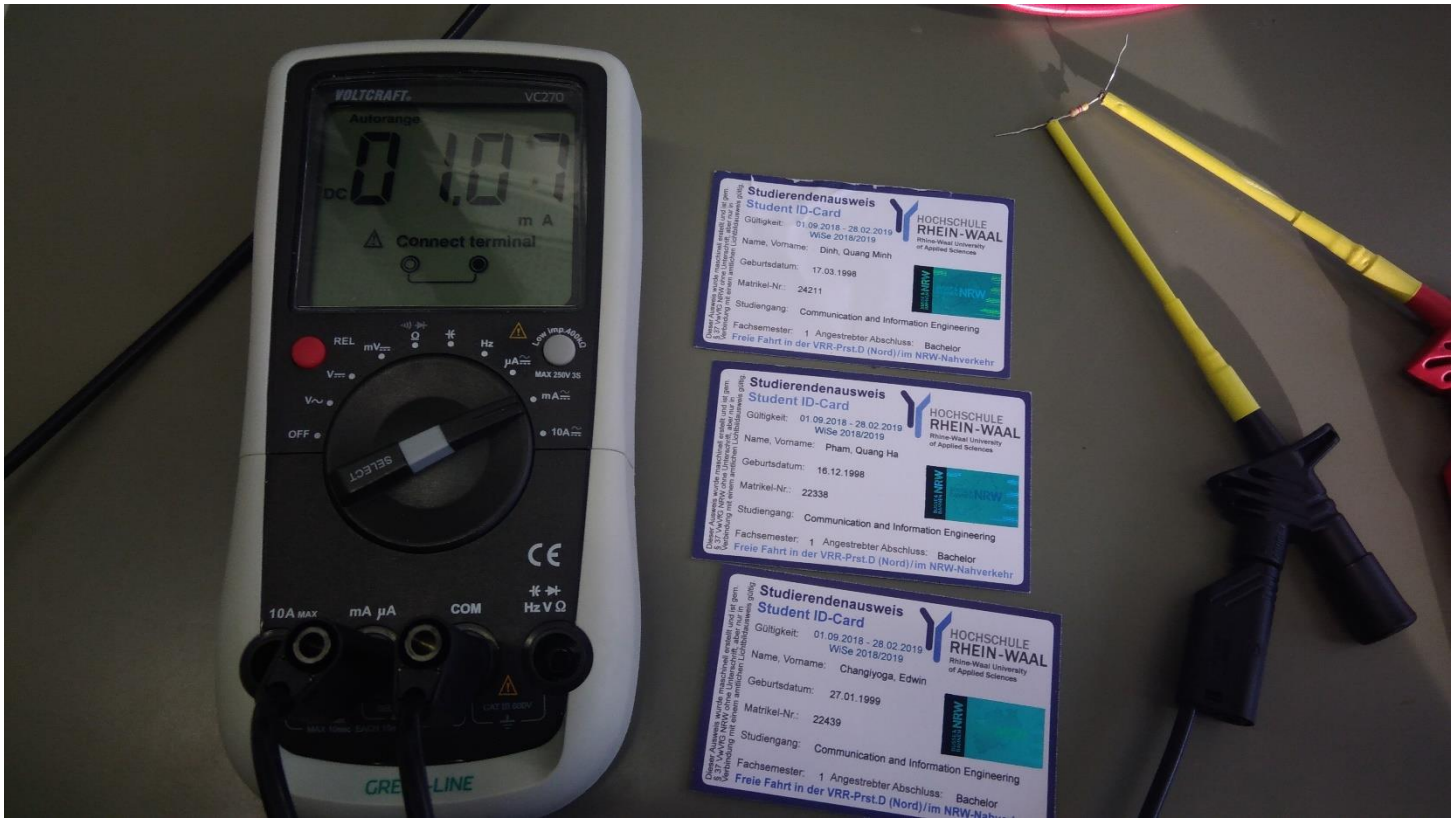
VOLTCRAFT
VC270
Autorange
DC 0 1,07
m A
Connect terminal
REL
Hz
OFF
SELECT
10A MAX
mA µA
COM
Hz V Ω
Studierendenausweis
Student ID-Card
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Freie Fahrt in der VRR-Prst.D (Nord)/im NRW-Nahverkehr

Result:

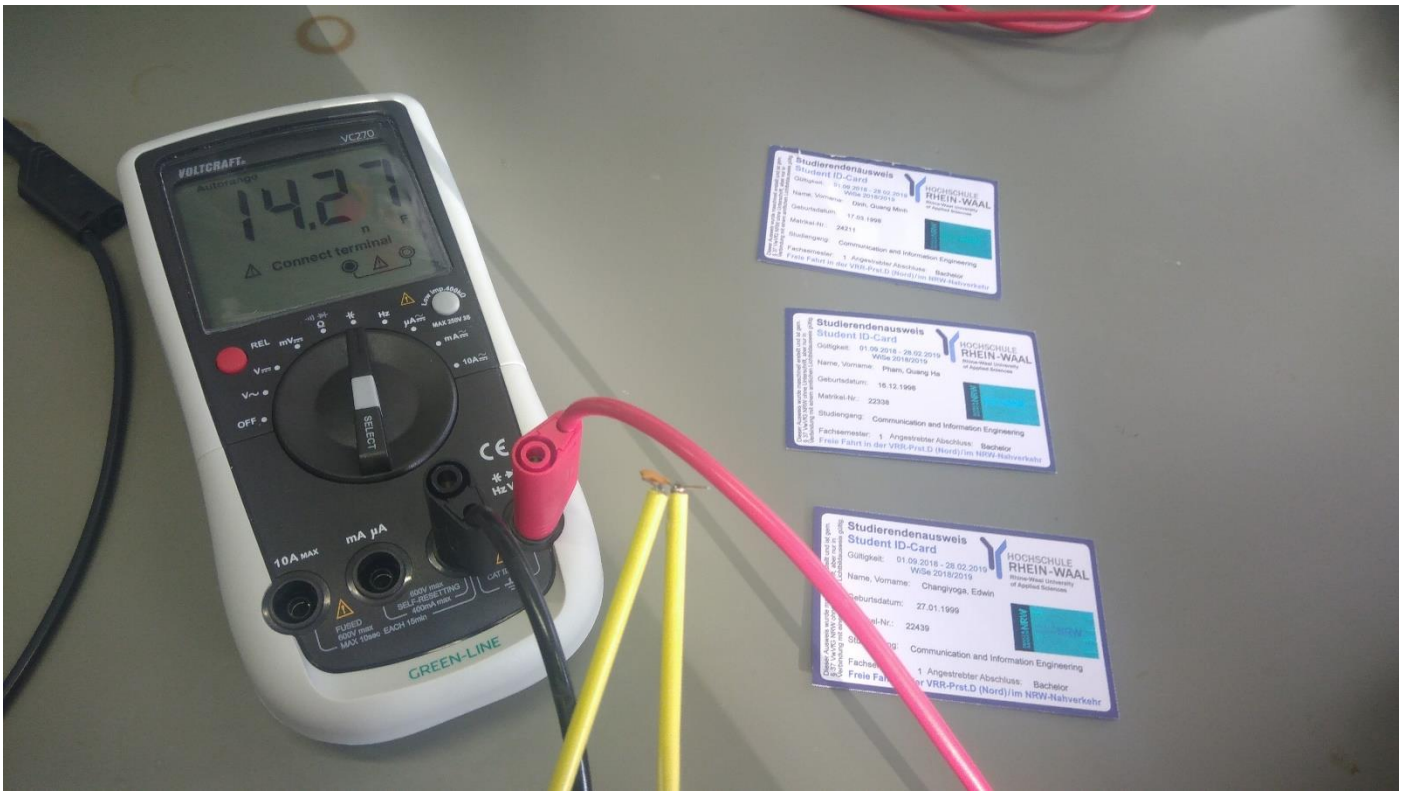
Output of Power Supply	Power Dissipation [W]	Calculated Current [A]	Measured Current [A]
Left Output (20V/100mA)	2	0.0043	0.00427
Right Output (12V/200mA)	2.4	0.0026	0.00239
Fixed Output (5V/2A)	10	0.0010	0.00107

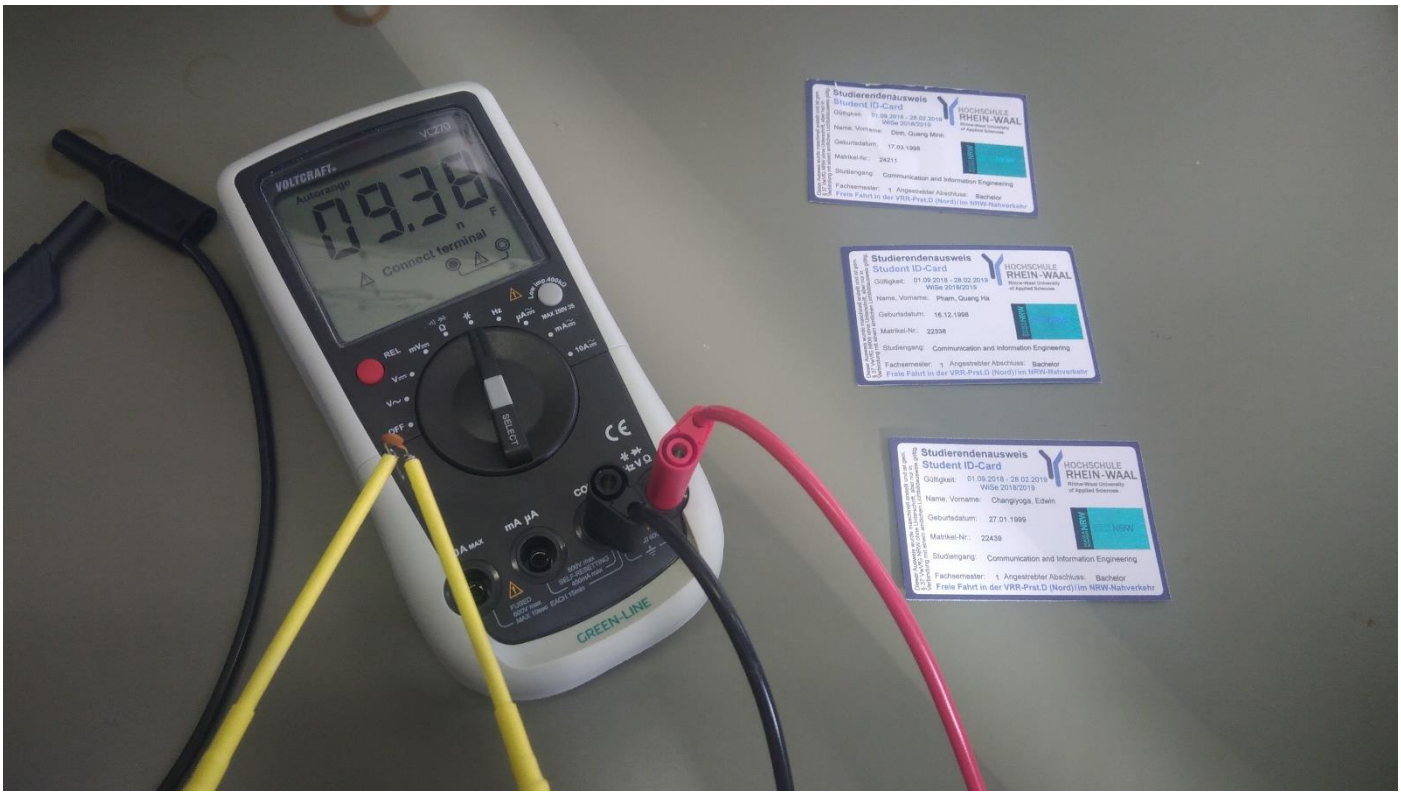
Challenge #6

Abstract:

Our group managed to follow the steps given in the Description and completed the challenge without anything special to report.

Pictures:





Result:

Capacitor	Capacitance [F]
#1	0.00000001427
#2	0.00000000938

Challenge #7

Abstract:

Our group managed to follow the steps given in the Description and completed the challenge without anything special to report.

Result:

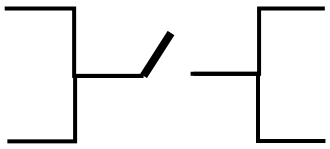


Figure 1: Black switch

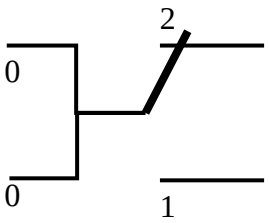


Figure 2: Blue switch