



Training Action 2

Santa Catarina, Brazil
August 22th – 26th, 2016

IPP/ISEP

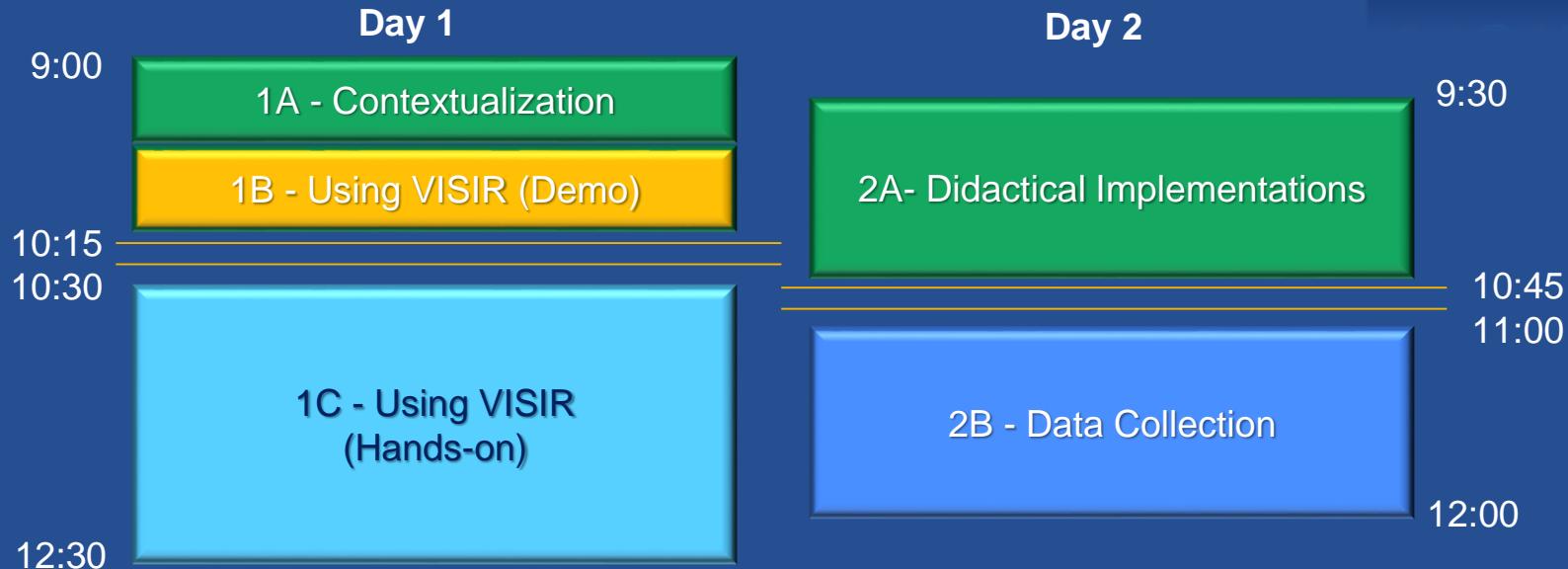
Arcelina Marques (mmr@isep.ipp.pt)
Carlos Felgueiras (mcf@isep.ipp.pt)
Natéria Lima (nmm@isep.ipp.pt)
Ricardo Costa (rjc@isep.ipp.pt)

POLITÉCNICO
DO PORTO



Co-funded by the
Erasmus+ Programme
of the European Union

TA2 Structure



POLITÉCNICO
DO PORTO



Co-funded by the
Erasmus+ Programme
of the European Union



Using VISIR

Day 1 – Sessions 1B

POLITÉCNICO
DO PORTO



Co-funded by the
Erasmus+ Programme
of the European Union

Outline

1. Introduction to VISIR

- 1.1 Web access
- 1.2 Experiments preparation
- 1.3 Hardware, connections and *MaxLists*
- 1.4 Users and circuits

2. Demo

3. Hands-on training



Introduction to VISIR

Introduction to VISIR (web access)

Main access

Courses Management

Courses Management

Experiments (access, preparation)

Introduction (experiments preparation)



Component
List file
(*.list)

SHORTCUT_1_4 B I
SHORTCUT_1_5 F 0
SHORTCUT_1_11 O C
SHORTCUT_1_12 H 0
SHORTCUT_1_13 A

 SHORTCUT_1_4 B I

 SHORTCUT_1_5 F 0

 SHORTCUT_2_1 G F

 SHORTCUT_1_11 O C

 SHORTCUT_1_12 H 0

 SHORTCUT_1_13 A G

 SHORTCUT_1_14 A B

 SHORTCUT_2_1 G H



Course management

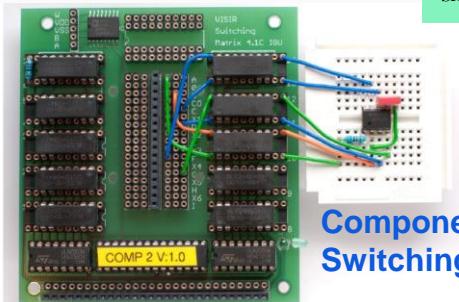
MaxList file (*.max)

VFGENA_FGENA1 A 0 max:6
VDCCOM_1 0

R_R1_10 B C 470

C_C2_9 E I 1u

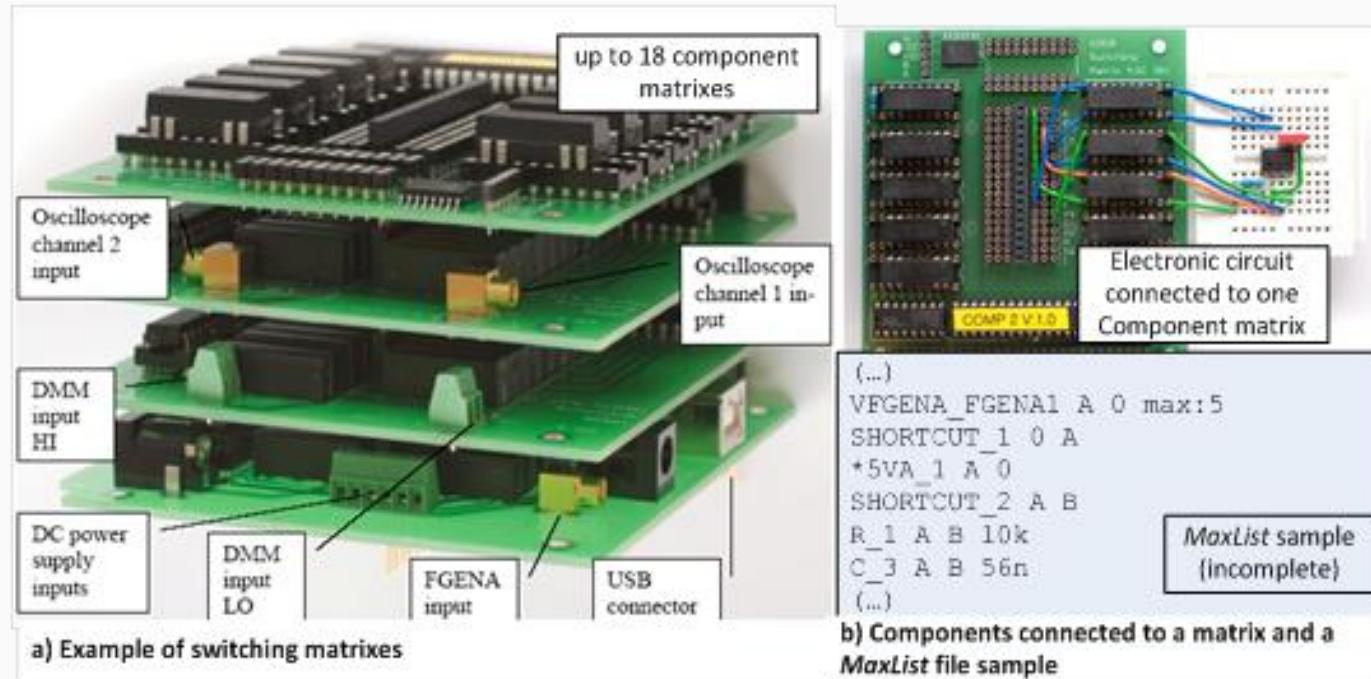
SHORTCUT_S1_5 F 0
SHORTCUT_S1_14 A B
SHORTCUT_S2_6 G 0
SHORTCUT_S2_7 F G
SHORTCUT_S3_13 C E
SHORTCUT_S4_6 I G



Components attached to a
Switching Matrix

Introduction (Hardware, connections and *MaxLists*)

These rules must be defined according to the available hardware connections defined in the *ComponentList* file



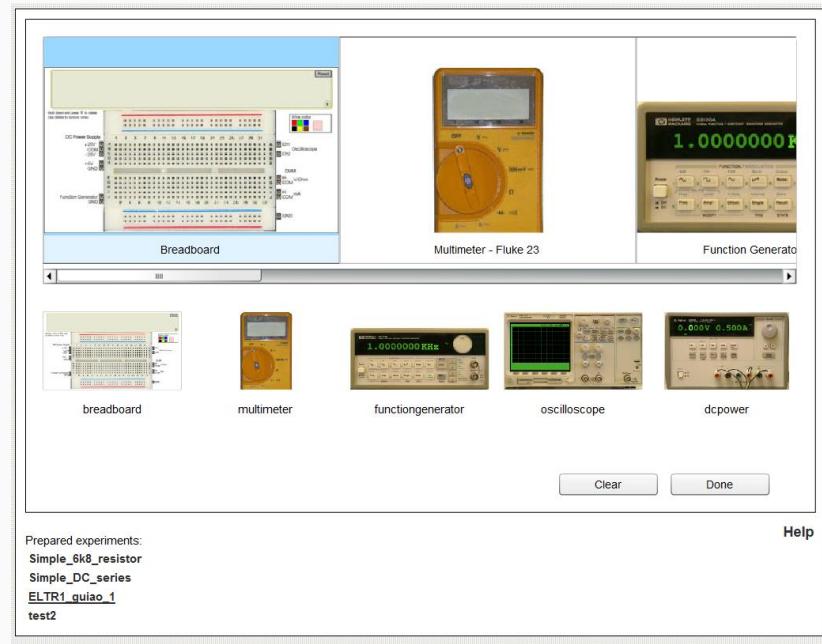
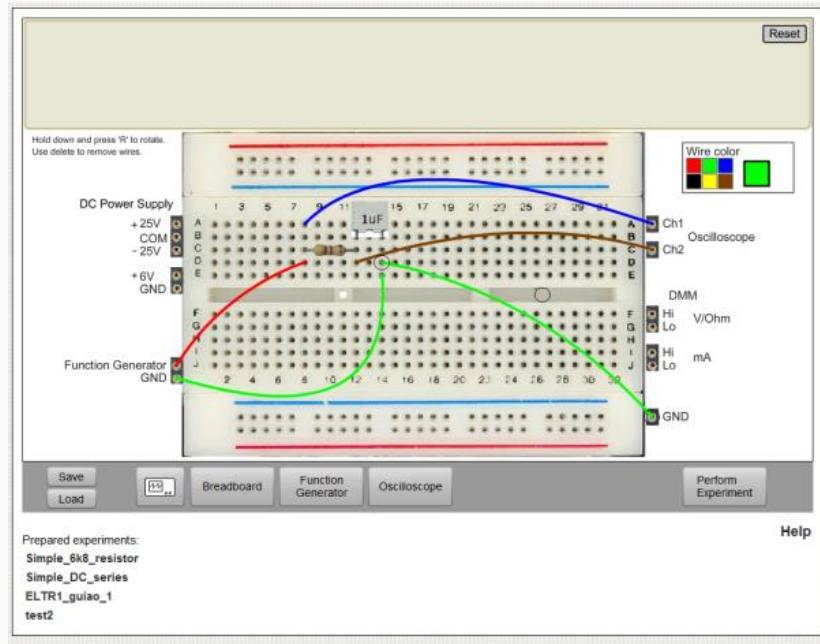
Introduction (Hardware, connections and *MaxLists*)

Pictures of the VISIR system installed at ISEP



Introduction (Users and circuits)

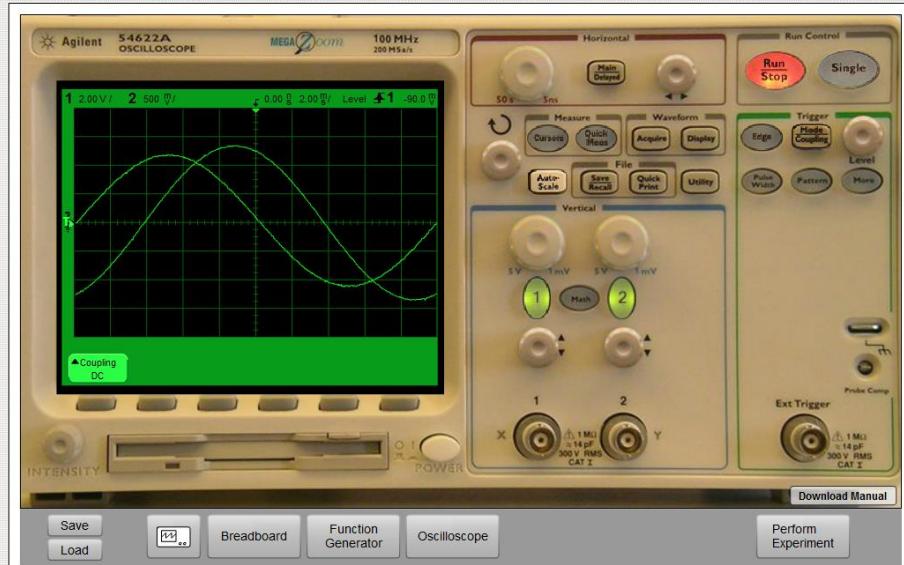
Virtual breadboard and instrument selection using the VISIR



Introduction (Users and circuits)



Instruments interfaces used during a remote experiment using VISIR



Introduction (Users and circuits)



Course management

OpenLabs Electronics Laboratory

MAIN MENU

- Start
- About
- Demo
- FAQ

ADMIN

- Wiki Pages
- Admin courses
- Users

TEACHER

- ELTR1_2016

STUDENT

- ELTR1_2016

isep



This VISIR laboratory is set up in collaboration with The School of Engineering at Blekinge Institute of Technology, in Sweden.



Courses			
Course name	Start	End	Max Users
Teste VISIR updated	2010-12-21	2010-12-28	100
FSIAP (LEI)	2010-09-24	2011-03-28	550
TCIRC (LEEC)	2011-02-20	2011-07-31	340
Guest_course_UD	2011-02-20	2011-07-31	50
ELTR1 (LEMA)	2011-02-16	2011-08-31	70
INSA1 (LECIM)	2011-02-21	2011-09-15	80
Teste Config	2010-09-16	2011-09-16	20
Workshop 19Jan2011			
FEELLE			
ELTR2 (LEEC)			
FISIC (LEM)			
FISIC (LEQ)			
CFISI (LEC)			
UFSC_Aranagua			
ELTR1 (LEMECANICA)			
SELEC			
INSA1 (LEIM)			
ELTR1 (LEMECANICA) 12_13			
fred01			
Collaboration_ALGuds			
Razwan_Test			
VISIR_WK_2015			
ELB-20302			
ELN-1202			
AMP-20303			
ELN-22105			
Test_course			
IFSC_IPP			
ELTR1_2016			
Estagio_CIC			
Razwan_PhD_work			
CINEL_WS			
LEE-SEE-ELTR0_15_16			
University of Zakhro			
Kees1			
Trial_at_UStuttgart			
Guest course			
test			
Basic_circuits			
Test_course			
ISEP IPP			
Add course			

OpenLabs Electronics Laboratory

MAIN MENU

- Start
- About
- Demo
- FAQ

Logout

Edit course

Name	ELTR1_2016
Start	2016-03-09
End	2016-08-31
Max Users	310
Max Seats	10

Update **Remove**

View as teacher

Responsible for course

E-Mail	rjc@isep.ipp.pt ricardo.jsons.costa@gmail.com	User Type	Teacher	Remove
E-Mail		User Type	Instructor	Remove

Embed

Prepared experiments

Name	Guiao_3	X	Embed
------	---------	---	-------

Add prepared experiment

Reservations

Make teacher scheduled reservation

If you have any questions about this page or the laboratory, contact the [administrator](#)

This VISIR laboratory is set up in collaboration with The School of Engineering at Blekinge Institute of Technology, in Sweden.

1151410@isep.ipp.pt	Student	0	.	.	.	.	X
1151431@isep.ipp.pt	Student	0	.	.	.	.	X
1151432@isep.ipp.pt	Student	0	.	.	.	.	X
1151697@isep.ipp.pt	Student	0	.	.	.	.	X
1151769@isep.ipp.pt	Student	0	.	.	.	.	X
1151860@isep.ipp.pt	Student	0	.	.	.	.	X
1970210@isep.ipp.pt	Student	0	.	.	.	.	X
rja@isep.ipp.pt	Student	0	.	.	.	.	X
rnd@isep.ipp.pt	Student	0	.	.	.	.	X

E-Mail

Separate multiple users by newline

User Type Student **Add**

If you have any questions about this page or the laboratory, contact the [administrator](#)

OpenLabs Electronics Laboratory

Logout

EL TR1_2016

Start	2016-03-09
End	2016-08-31
Max Users	310
Max Seats	10
LMS link	Copy this

Prepared experiments

Name	Guiao_3	X	Embed
------	---------	---	-------

Add prepared experiment

Reservations

Make teacher scheduled reservation

Users

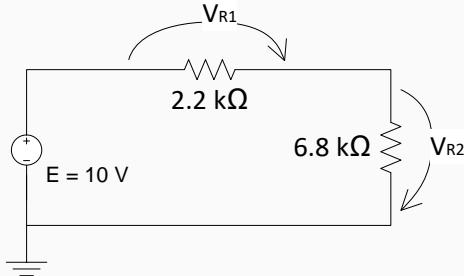
E-Mail	User Type	Sessions	Activated	Enabled
mmr@isep.ipp.pt	Student	0	.	X
gca@isep.ipp.pt	Student	1	.	X
aav@isep.ipp.pt	Student	0	.	X
rjc@isep.ipp.pt	Teacher	6	.	X
ricardo.jsons.costa@gmail.com	Instructor	3	.	X
1091033@isep.ipp.pt	Student	0	.	X
1101479@isep.ipp.pt	Student	0	.	X
1071002@isep.ipp.pt	Student	0	.	X
1100425@isep.ipp.pt	Student	0	.	X
1090390@isep.ipp.pt	Student	0	.	X
1060865@isep.ipp.pt	Student	0	.	X
1050034@isep.ipp.pt	Student	0	.	X



Demo

Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_demo1)

Serial resistor circuit

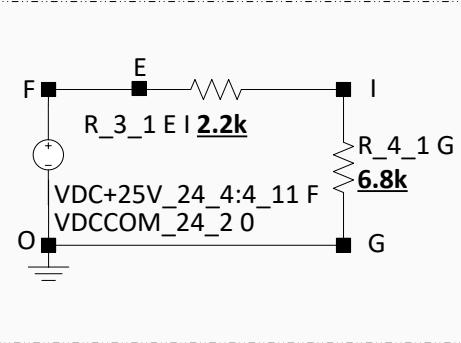


MaxList

VDC+25V_24_4:4_11 F
VDCCOM_24_2 0

R_3_1 E I 2.2k
R_4_1 G I 6.8k

SHORTCUT_3_14 E F
SHORTCUT_2_6 G O

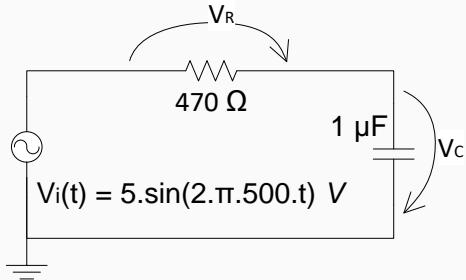


MaxList defined according to the following nodes using the available components connections specified in the *componentList* file.

1. Observe the value of each resistor using the interface and confirm it with the DMM;
2. Selecting the +25 V DC power, setup the circuit in the virtual breadboard and connect the outputs +25V and COM to the circuit (connect the COM to the GND).
3. Connect the DMM and measure the voltage in each resistor;
4. Connect the DMM to measure the current in the circuit; a) Place the DMM between the voltage source and the resistor; b) Place the DMM between both resistors and observe that there is an error (verify the rules defined in the *MaxList* file that is also available in Annex C);
5. Swap the resistors and observe that there is an error (rules defined in the *MaxList* file also available in Annex C).

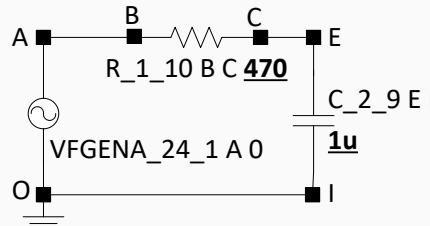
Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_demo2)

Serial RC circuit



MaxList

```
VFGENA_24_1 A 0
R_1_10 B C 470
C_2_9 E I 1u
SHORTCUT_3_13 C E
SHORTCUT_1_14 A B
SHORTCUT_3_6 O I
```

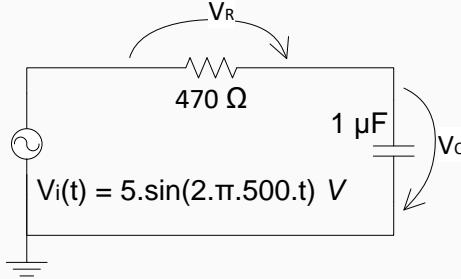


MaxList defined according to the following nodes using the available components connections specified in the *componentList* file.

1. Observe the value of each component using the interface and confirm the value of the resistor with the DMM;
2. Setup the circuit in the virtual breadboard and adjust the voltage and the frequency levels of the Function Generator as indicated;
3. Confirm the adjusted voltage and frequency levels using the Oscilloscope.
4. Connect the terminals of the Oscilloscope to observe simultaneously the signal generated by the function generator, $vi(t)$, and the signal in the capacitor, $vc(t)$ (test the different buttons available in the oscilloscope);
5. Adjust the Oscilloscope as you traditionally do in a hands-on laboratory to calculate the gap between both signals;

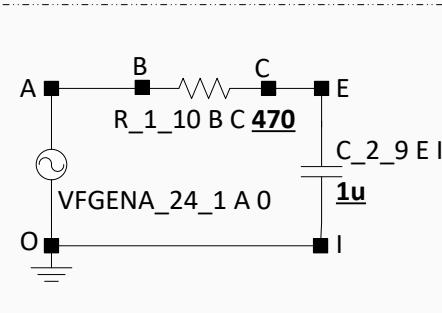
Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_demo2)

Serial RC circuit



MaxList

```
VFGENA_24_1 A 0
R_1_10 B C 470
C_2_9 E I 1u
SHORTCUT_3_13 C E
SHORTCUT_1_14 A B
SHORTCUT_3_6 O I
```



MaxList defined according to the following nodes using the available components connections specified in the *componentList* file.

6. Do not connect the instruments' grounds and observe if there is any error;
7. Verify the restrictions imposed by the VISIR to observe simultaneously the signals in the resistor, $vr(t)$, and in the capacitor $vc(t)$;
8. Swap the positions of R and C components and observe the generated error (verify the rules in the *MaxList* file that is also available in Annex C);
9. Using the DMM, measure the voltages and the currents in the circuit.

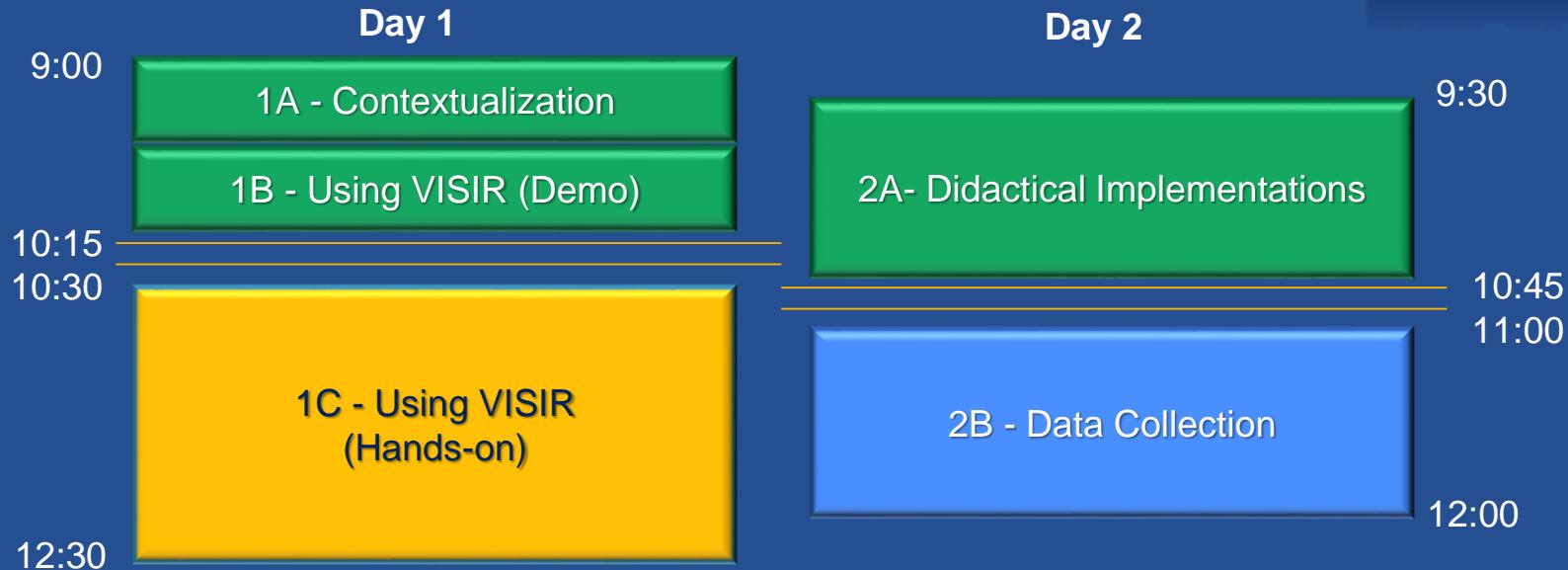


Thank you for your attention!



Co-funded by the
Erasmus+ Programme
of the European Union

TA2 Structure



POLITÉCNICO
DO PORTO



Co-funded by the
Erasmus+ Programme
of the European Union



Using VISIR: Hands-on

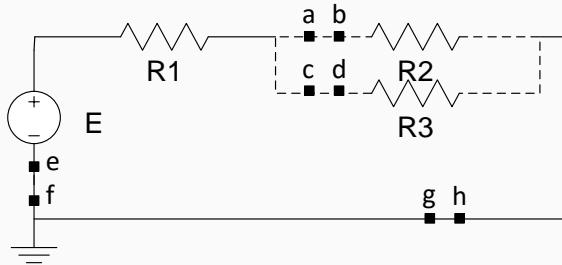
Day 1 – Sessions 1C

POLITÉCNICO
DO PORTO



Co-funded by the
Erasmus+ Programme
of the European Union

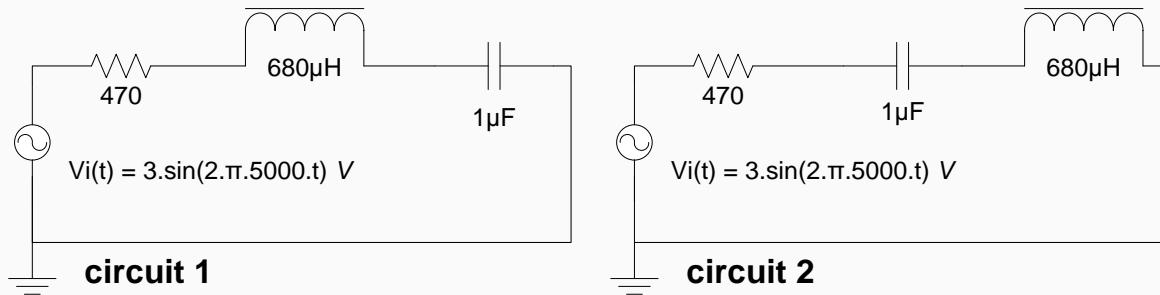
Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_circuit1)



Available resistors			
R1 [Ω]	1.0k	470	22k
R2 [Ω]	2.2k	open	
R3 [Ω]	82k	open	

1. Setup one circuit in the breadboard according to the available resistors in the table;
2. Selecting the DC power, connect the outputs +6V and GND to the circuit;
3. Adjust the voltage source to $E=6$ V and confirm the value using the DMM;
4. Using the DMM measure the currents in the different branches of the circuit (note: if you try to measure the currents between the indicated points a-b, c-d, e-f or g-h an error will be generated - see the MaxList file in the Annex C -);
5. Using the DMM measure the voltage in each component;
6. Repeat this analysis to the other circuits able to setup according to the possibilities indicated in the table.

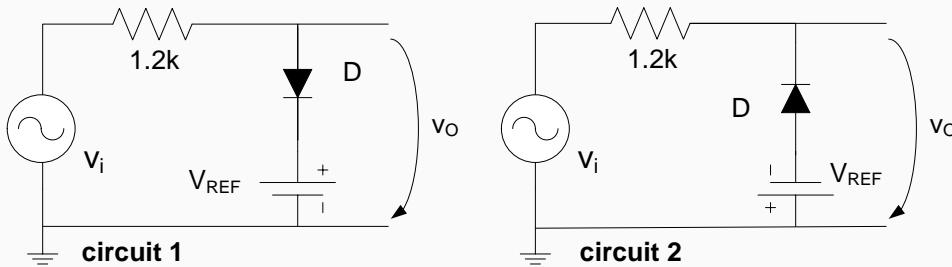
Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_circuit2)



1. Setup circuit 1 and adjust $\text{Vi}(t)$ to the indicated values;
2. Using both channels of the oscilloscope confirm and visualize $\text{Vi}(t)$ and $\text{Vc}(t)$;
3. Using the DMM measure the RMS current in the different branches;
4. Using the DMM measure the RMS voltage in each component;
5. Setup circuit 2 and adjust the $\text{Vi}(t)$ to the indicated values;
6. Using both channels of the oscilloscope confirm and visualize $\text{Vi}(t)$ and $\text{VL}(t)$;
7. Using the DMM measure the RMS current in the different branches;
8. Using the DMM measure the RMS voltage in each component.

Circuit 3: Limiting circuits with diodes

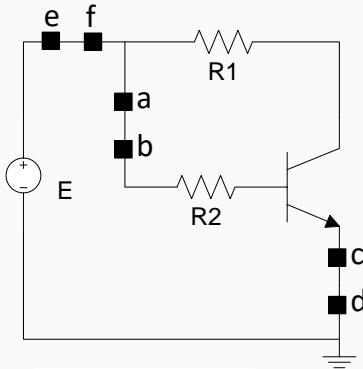
Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_circuit3)



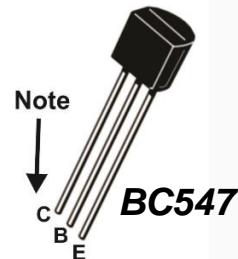
1. Setup circuit 1 and adjust the Function Generator to $V_i=5.\sin(2.\pi.5000.t)$ V and confirm that value using the Oscilloscope;
2. Selecting the DC power, connect the outputs +25V and COM to the circuit (connect the COM to the GND), and adjust $V_{REF}=2$ V. Confirm that value using the DMM;
3. Visualize V_i and V_o simultaneously using the Oscilloscope;
4. Change V_{REF} and verify that the commutation point of the diode changes;
5. Setup circuit 2 and repeat steps 2, 3 and 4.

Circuit 4: Circuit with BJT – DC operating point

Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_circuit4)



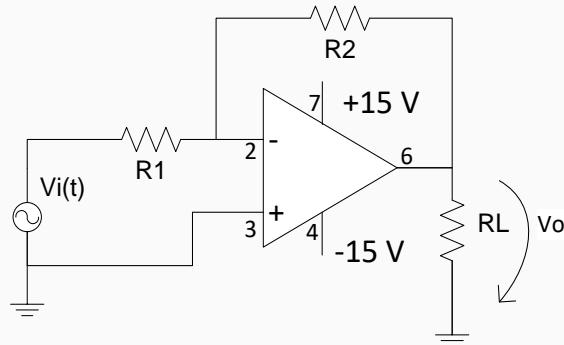
1. Setup the circuit, connect the DC power outputs +6V and COM (connect the COM to the GND), and adjust to $E=6$ V. Confirm that value using the DMM;
2. Using the DMM, fill-in the following table and evaluate the current state of the BJT (active, saturation or cut-off); (note: you can only measure currents between points a-b, c-d and e-f. Observe the MaxList file in Annex C.)



R1	R2	E	IC	IE	IB	VCE	VBE	VBC	state
6k8	22k	6 V							

Circuit 5: Amp-op Inverter Circuit

Web access: www.physicsslabfram.isep.ipp.pt (Course: TA_VISIR; Name: TA_circuit5)



$$R1 = 100 \text{ k}$$

$$R2 = 100 \text{ k or } 220 \text{ k}$$

$$RL = 2.2 \text{ k}$$

$$E = 6 \cdot \sin(2\pi \cdot 5000 \cdot t) \text{ V}$$

1. Setup the circuit in the virtual breadboard changing R2 according to the values indicated in the table.
2. Using the Function Generator adjust the Vi voltage according to the indicated in the figure and, using the Oscilloscope, verify the amplitude and the frequency;
3. Using the Oscilloscope observe Vi and Vo of the circuit;
4. Using the DMM measure the RMS:
 - voltage in the different components;
 - current in the load.



Thank you for your attention!



Co-funded by the
Erasmus+ Programme
of the European Union