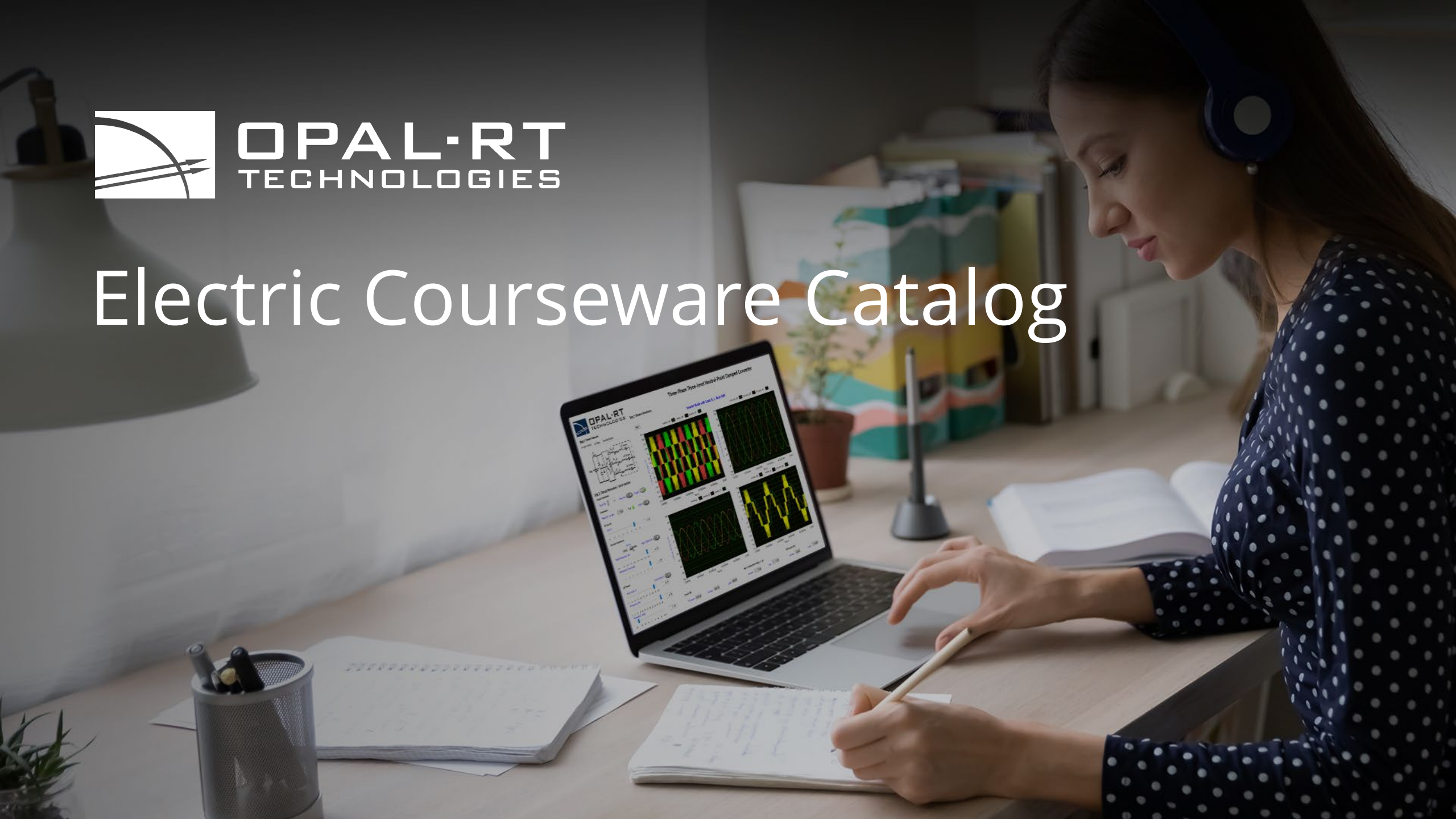




**OPAL-RT**  
TECHNOLOGIES

# Electric Courseware Catalog

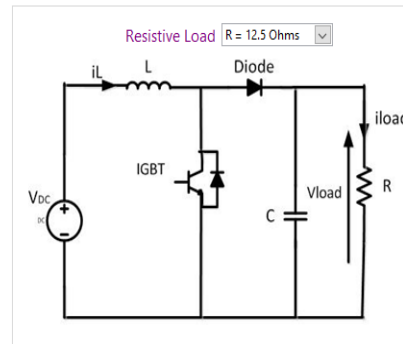


- Power Electronics, since 2014
- Electric Machines, since 2017
- Renewable Energy, since 2021
- Fundamentals of Electrical Engineering, since 2022
- Motor Drives, since 2022

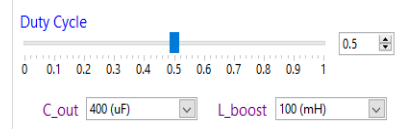
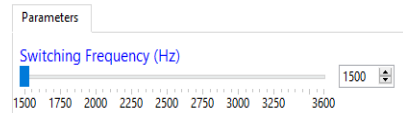
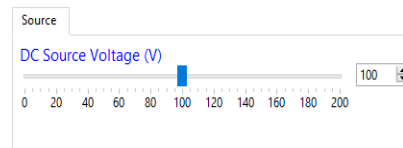
Topic	Suggested Lab Sessions
Choppers: DC / DC	Boost Chopper
	Buck Chopper
	Buck-Boost Chopper
Rectifiers: AC / DC	Single-phase Diode-based Rectifier
	Three-phase Diode-based Rectifier
	Three-phase Thyristor-based Rectifier
Two-level Inverters: DC / AC	Single-phase IGBT-based Inverter
	Three-phase Two-level IGBT-based Inverter
Three-level Converter: DC / AC & AC / DC	Three-phase Three-level IGBT-based NPC in Inverter and Rectifier Mode

## Features

- Scope:  
Trigger, Memory, y-scale & y-offset
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Varying DC Source Voltage
- Varying Switching Frequency
- Varying Duty Cycle
- Varying converter passive element:  
capacitor and inductor
- Loads:  
Resistive & Inductive



Trigger



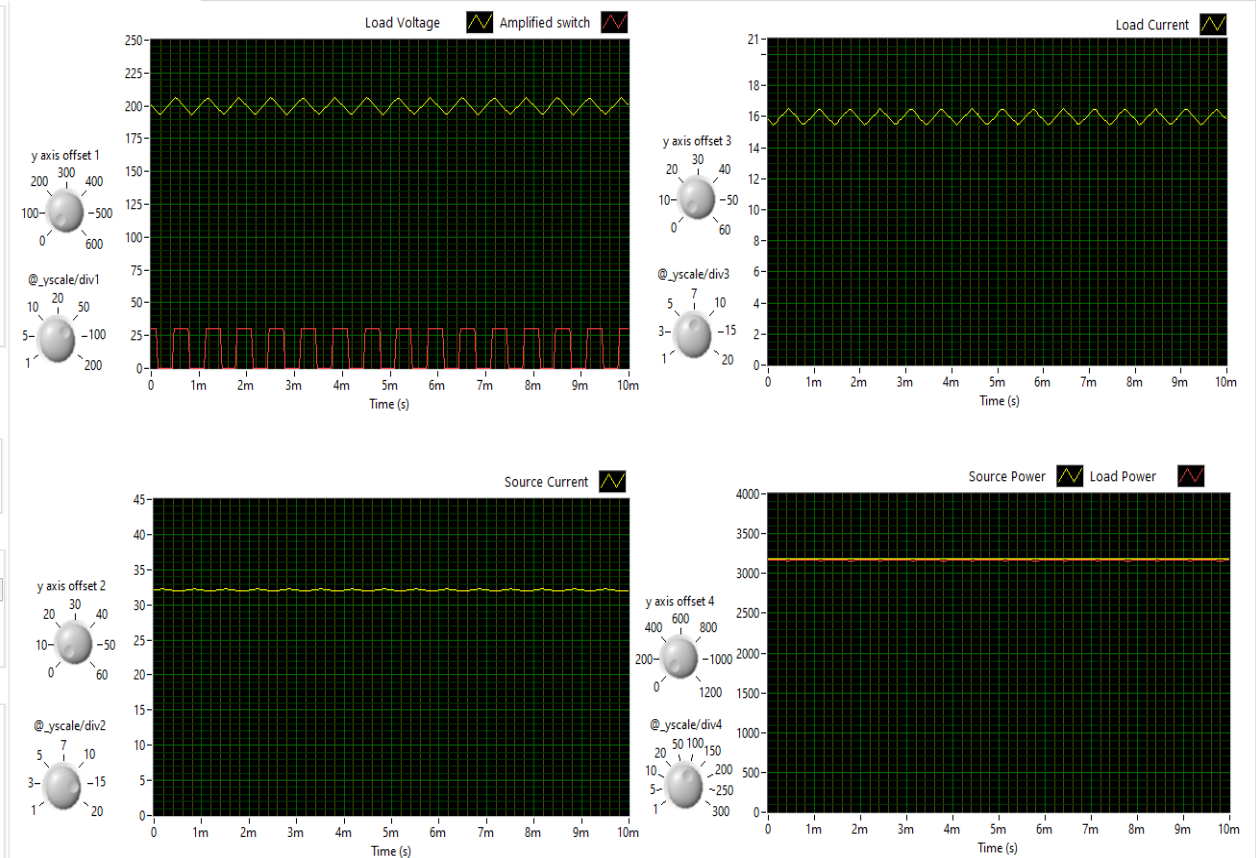
## Single-Phase Boost Converter Laboratory

HELP

Resistive/ Inductive Load

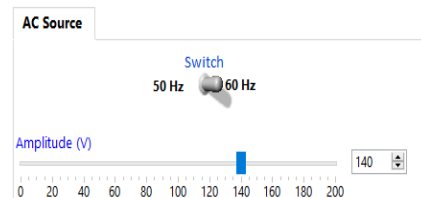
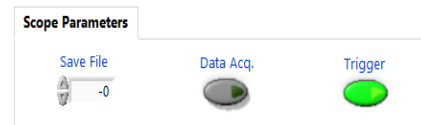
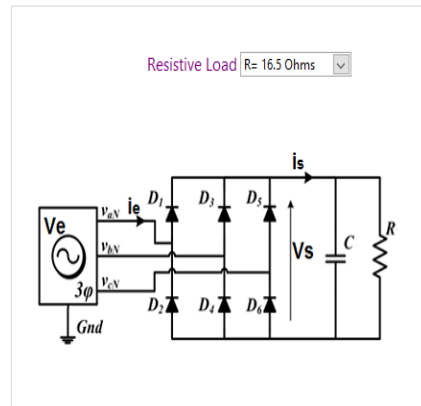
Pre-Selected

Resistive Load

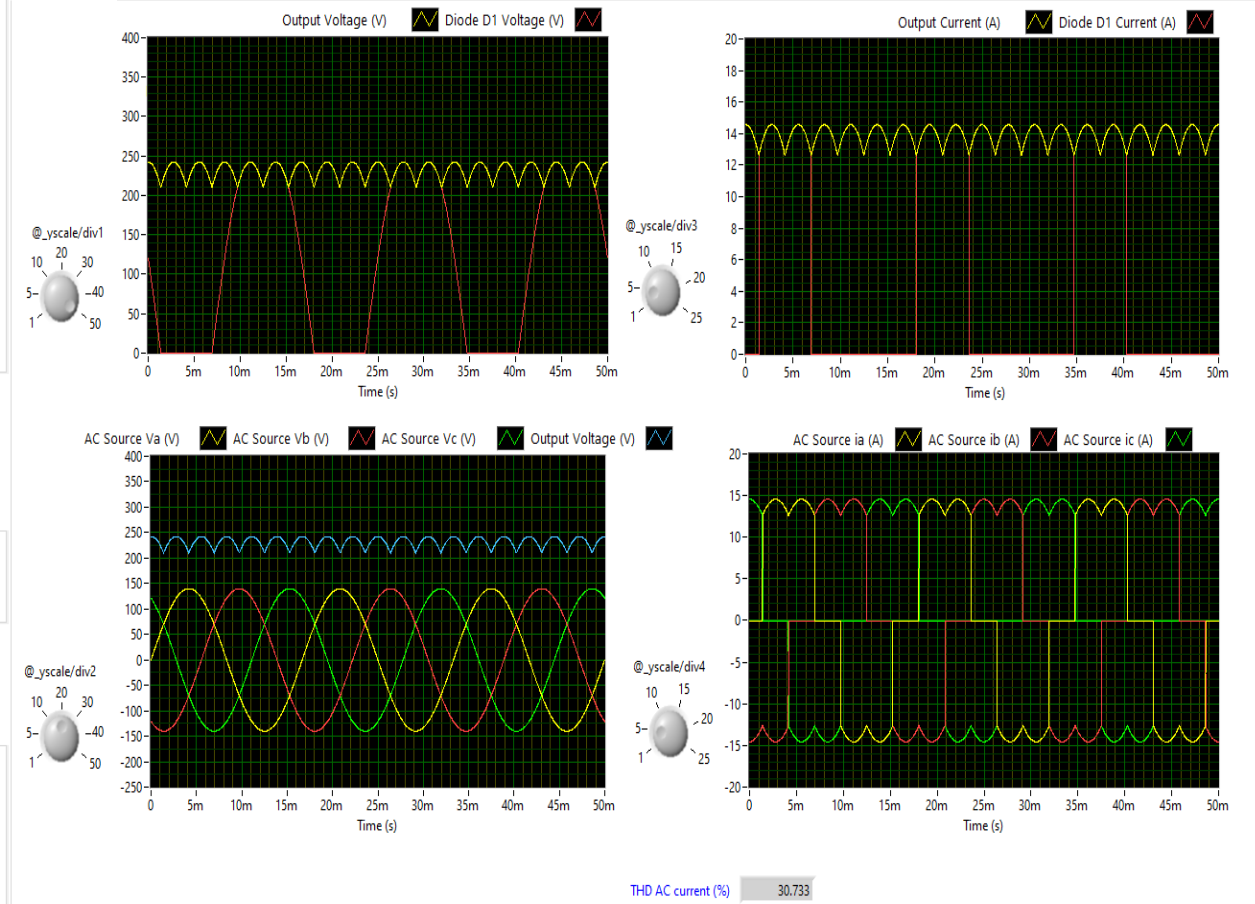


## Features

- Scope:  
Trigger, Memory, y-scale & y-offset
- Varying AC Source Voltage
- Selecting AC Source Frequency: 50Hz/60 Hz
- Loads:  
Resistive, Inductive & Capacitive
- Harmonic Analysis:  
Online & Offline



Three-Phase





# POWER ELECTRONICS

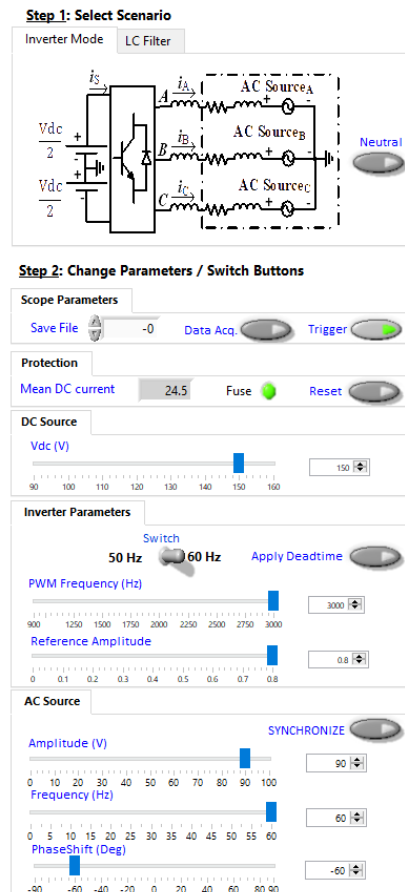
**Power Electronics**  
Electric Machines  
Renewable Energy  
Fundamentals Elec. Eng.  
Motor Drives

Choppers  
Rectifiers  
**Two-level Inverters**  
Three-level Converters



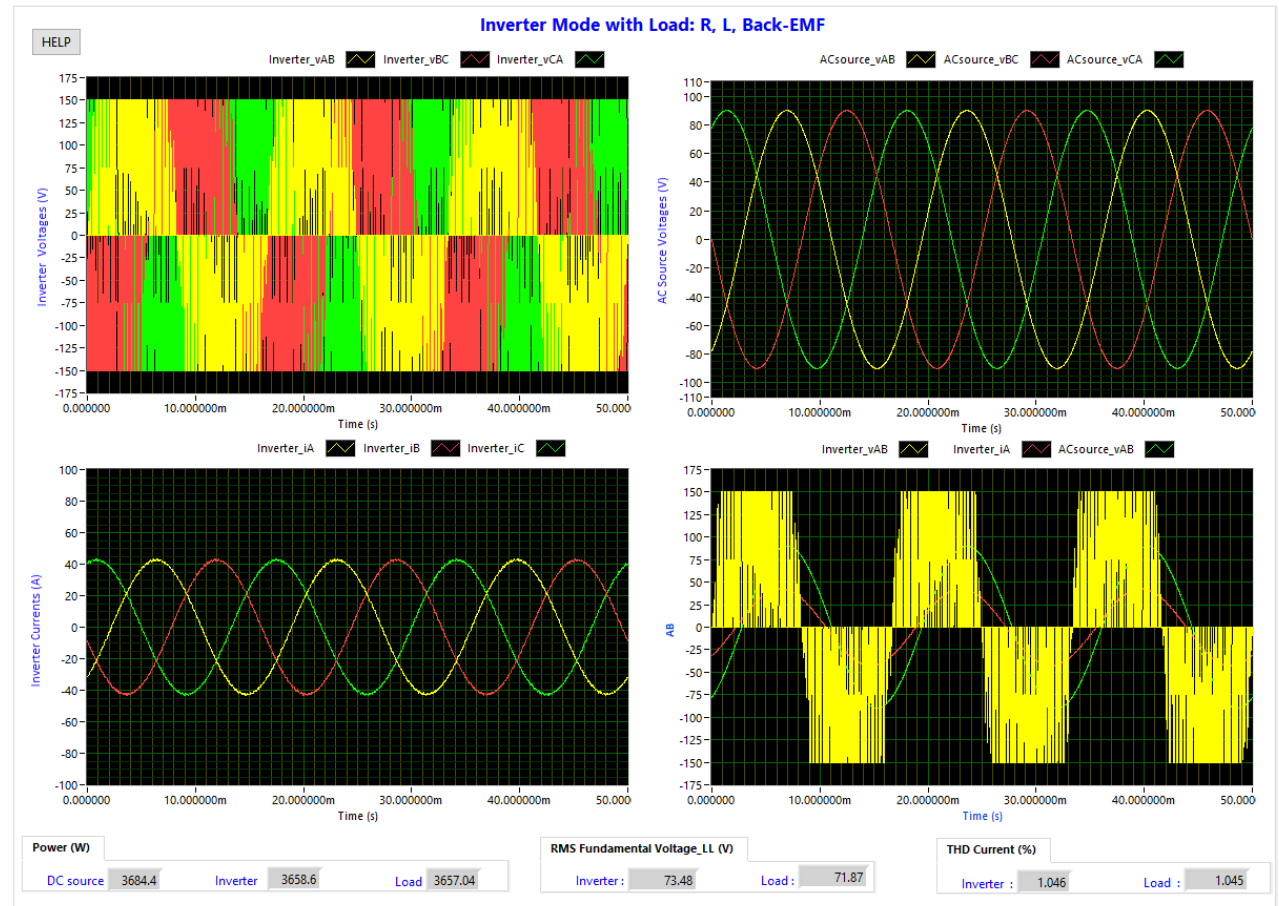
## Features

- Scope:  
Trigger, Memory,  
y-scale & y-offset
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Varying DC Source  
Voltage
- Varying PWM Frequency  
& Reference Amplitude  
(Modulation)
- Applying Dead-Time
- Selecting Reference:  
Frequency: 50/60 Hz
- Varying AC Source:  
Amplitude, Frequency  
& Phase-shift
- LC-Filter
- Load Neutral:  
Connect / Disconnect
- Harmonic Analysis:  
Online & Offline
- Power & Fundamental  
Computation:  
Source, Inverter & Load



## Three-Phase Two-Level Inverter

**Step 3: Observe Waveforms**



# POWER ELECTRONICS

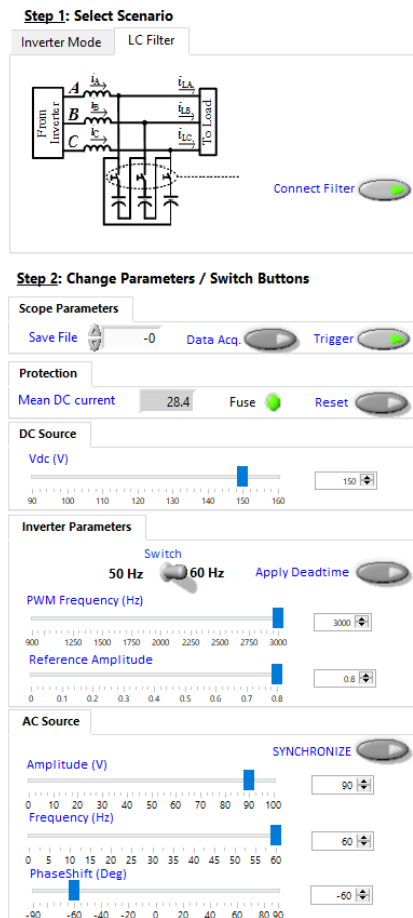
**Power Electronics**  
Electric Machines  
Renewable Energy  
Fundamentals Elec. Eng.  
Motor Drives

Choppers  
Rectifiers  
**Two-level Inverters**  
Three-level Converters



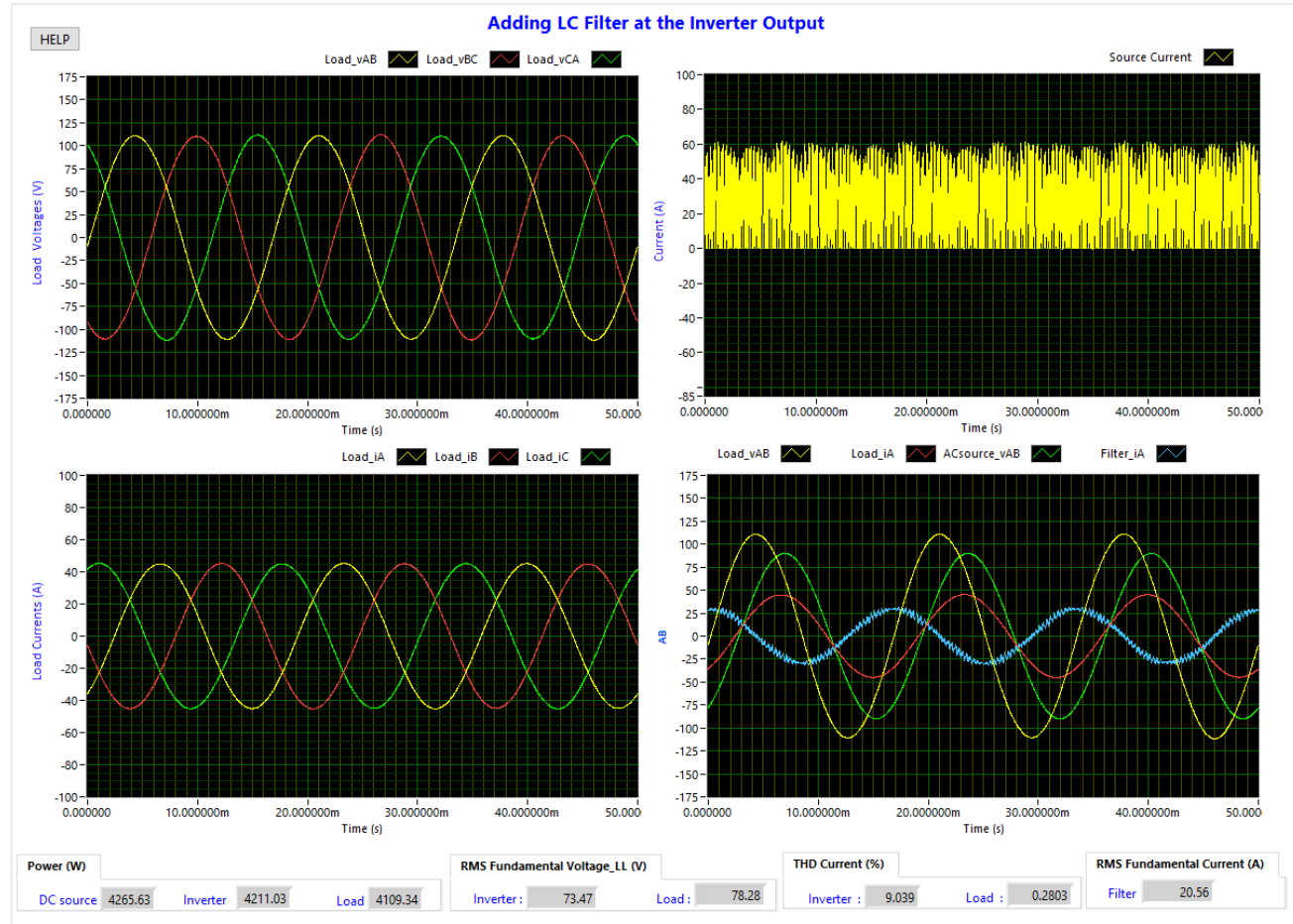
## Features

- Scope:  
Trigger, Memory,  
y-scale & y-offset
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Varying DC Source  
Voltage
- Varying PWM Frequency  
& Reference Amplitude  
(Modulation)
- Applying Dead-Time
- Selecting Reference:  
Frequency: 50/60 Hz
- Varying AC Source:  
Amplitude, Frequency  
& Phase-shift
- LC-Filter
- Load Neutral:  
Connect / Disconnect
- Harmonic Analysis:  
Online & Offline
- Power & Fundamental  
Computation:  
Source, Inverter & Load



Step 3: Observe Waveforms

## Three-Phase Two-Level Inverter



# POWER ELECTRONICS

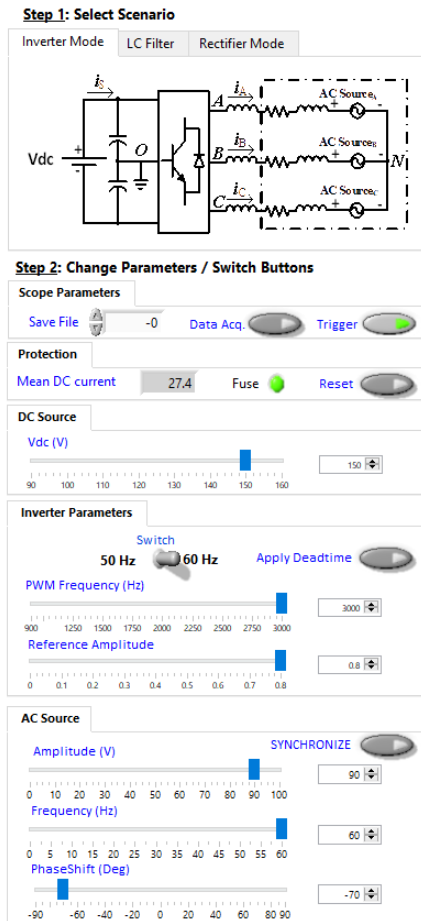
**Power Electronics**  
Electric Machines  
Renewable Energy  
Fundamentals Elec. Eng.  
Motor Drives

Choppers  
Rectifiers  
Two-level Inverters  
**Three-level Converters**



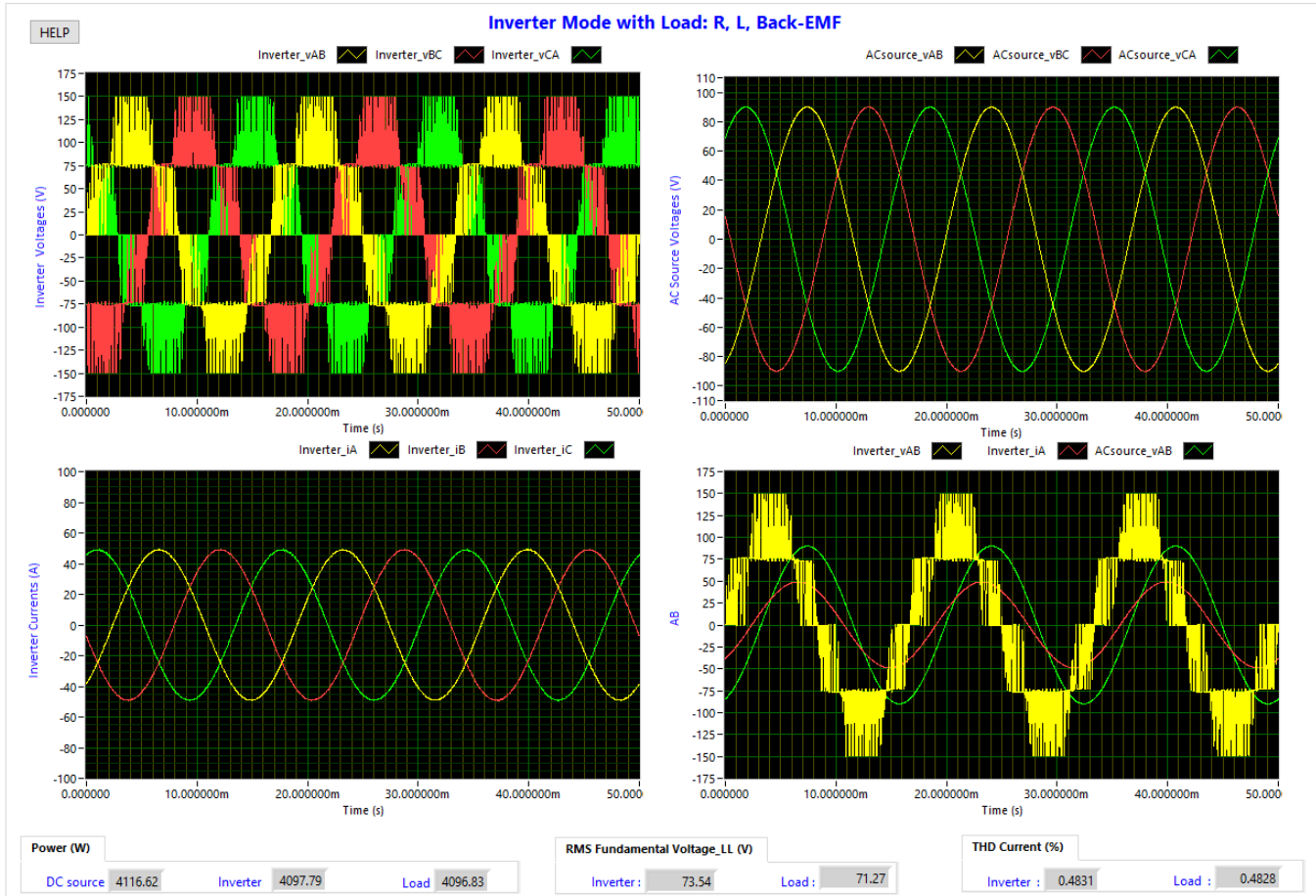
## Features

- Scope:  
Trigger, Memory,  
y-scale & y-offset
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Varying DC Source  
Voltage
- Varying PWM Frequency  
& Reference Amplitude  
(Modulation)
- Applying Dead-Time
- Selecting Reference:  
Frequency: 50/60 Hz
- Varying AC Source:  
Amplitude, Frequency  
& Phase-shift
- LC-Filter
- Harmonic Analysis:  
Online & Offline
- Power & Fundamental  
Computation:  
Source, Inverter & Load
- Mode: Inverter & Rectifier



## Three-Phase Three-Level Neutral-Point Clamped Converter

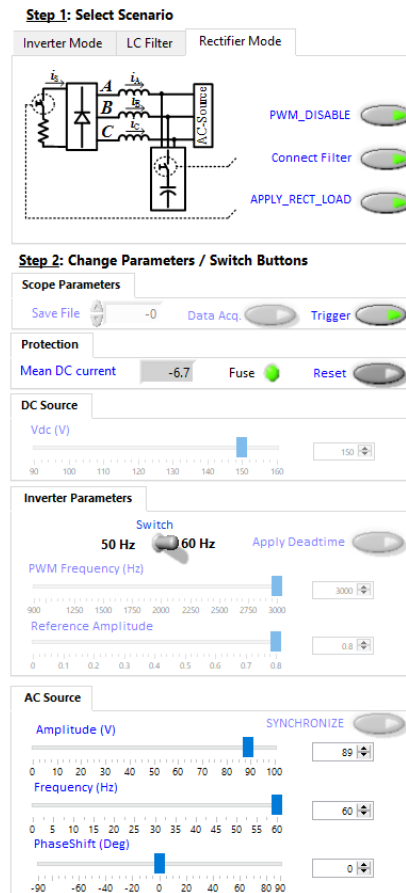
Step 3: Observe Waveforms





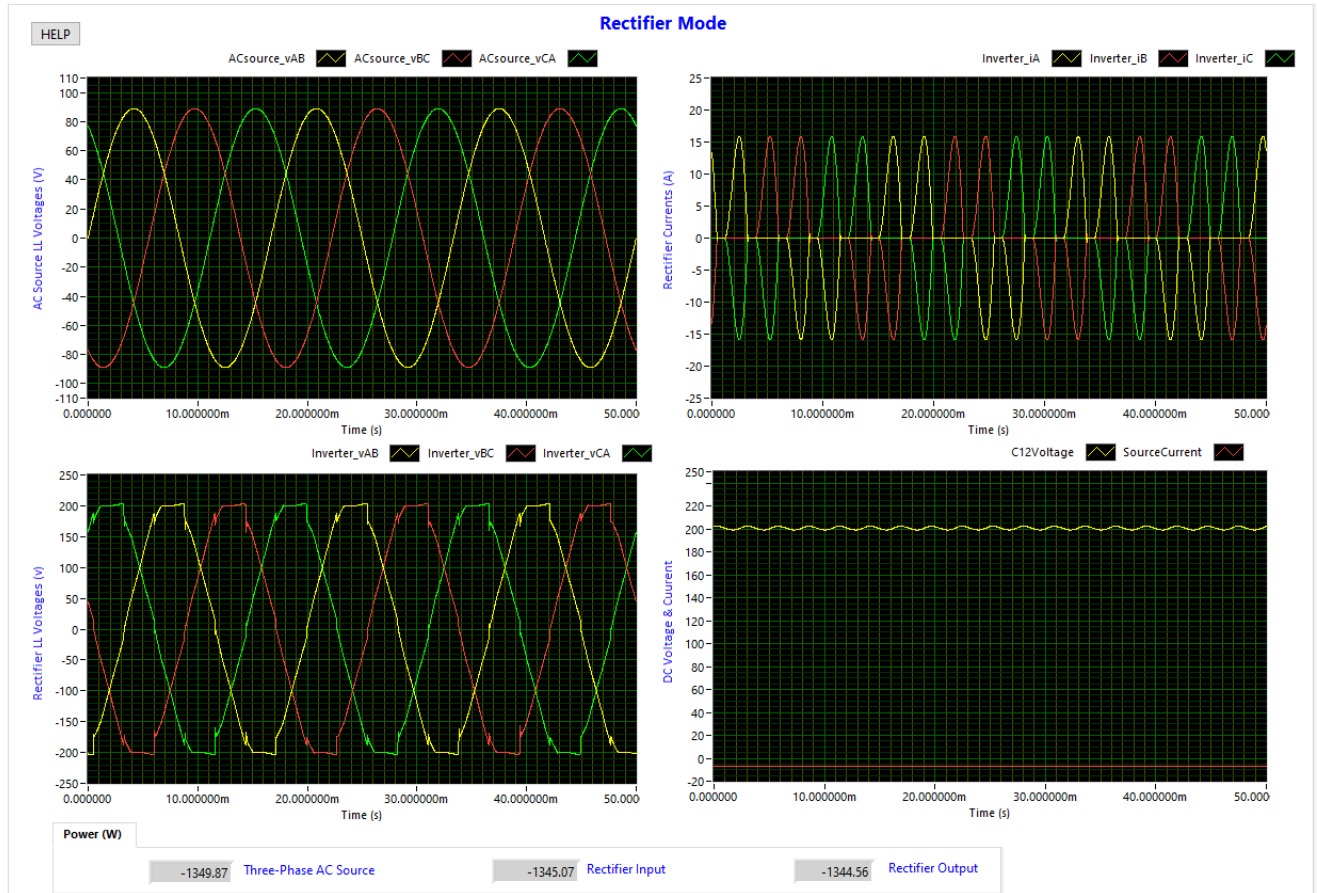
## Features

- Scope:  
Trigger, Memory,  
y-scale & y-offset
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Varying DC Source  
Voltage
- Varying PWM Frequency  
& Reference Amplitude  
(Modulation)
- Applying Dead-Time
- Selecting Reference:  
Frequency: 50/60 Hz
- Varying AC Source:  
Amplitude, Frequency  
& Phase-shift
- LC-Filter
- Harmonic Analysis:  
Online & Offline
- Power & Fundamental  
Computation:  
Source, Inverter & Load
- Mode: Inverter & Rectifier



## Three-Phase Three-Level Neutral-Point Clamped Converter

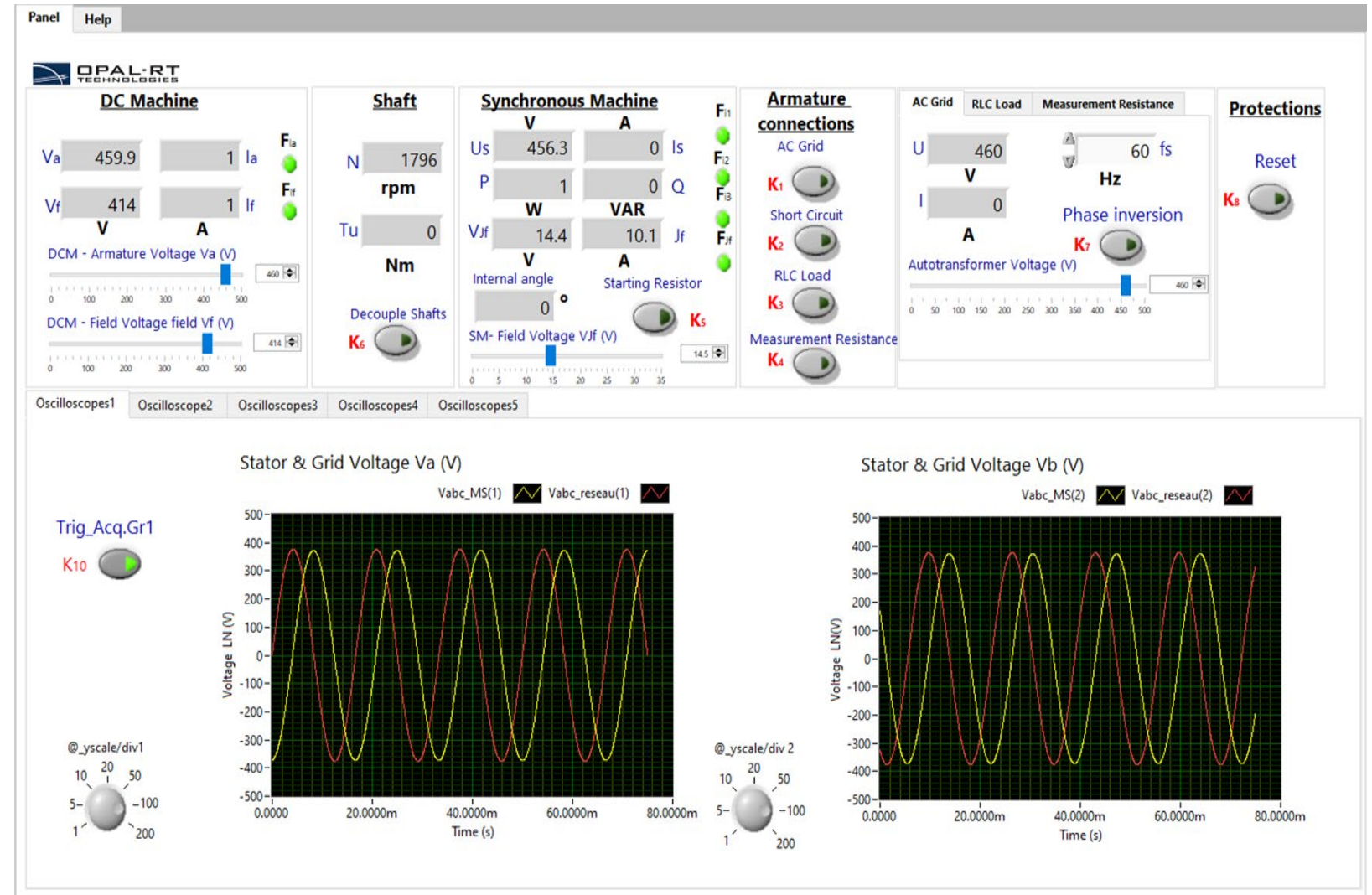
Step 3: Observe Waveforms



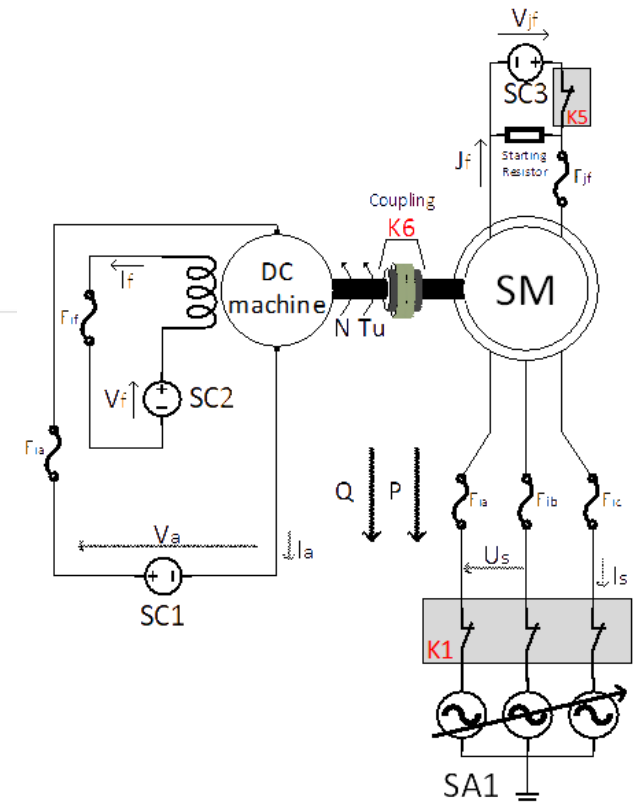
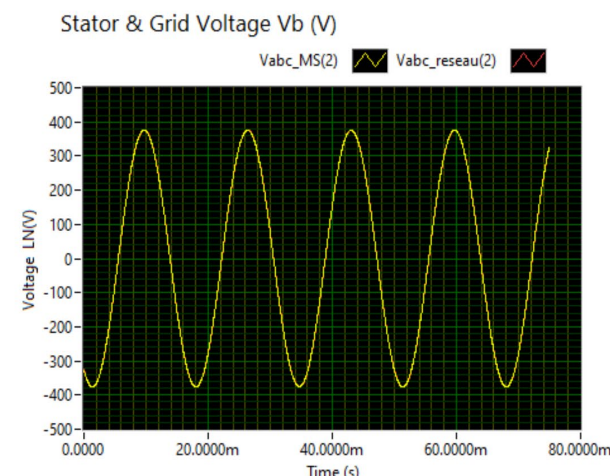
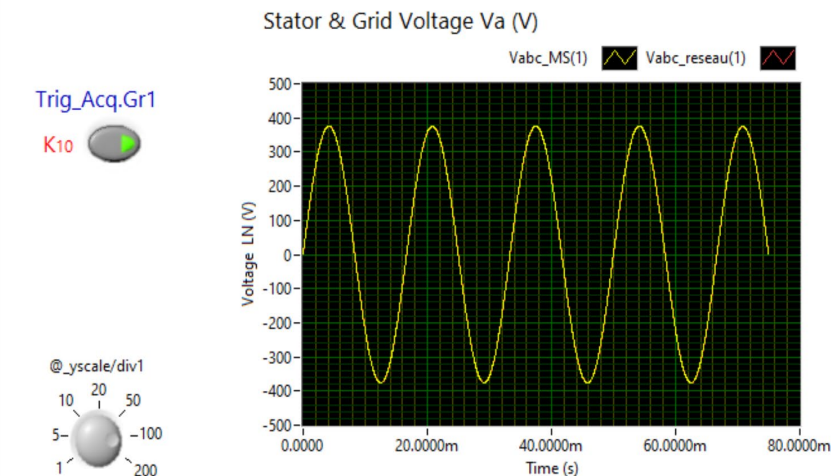
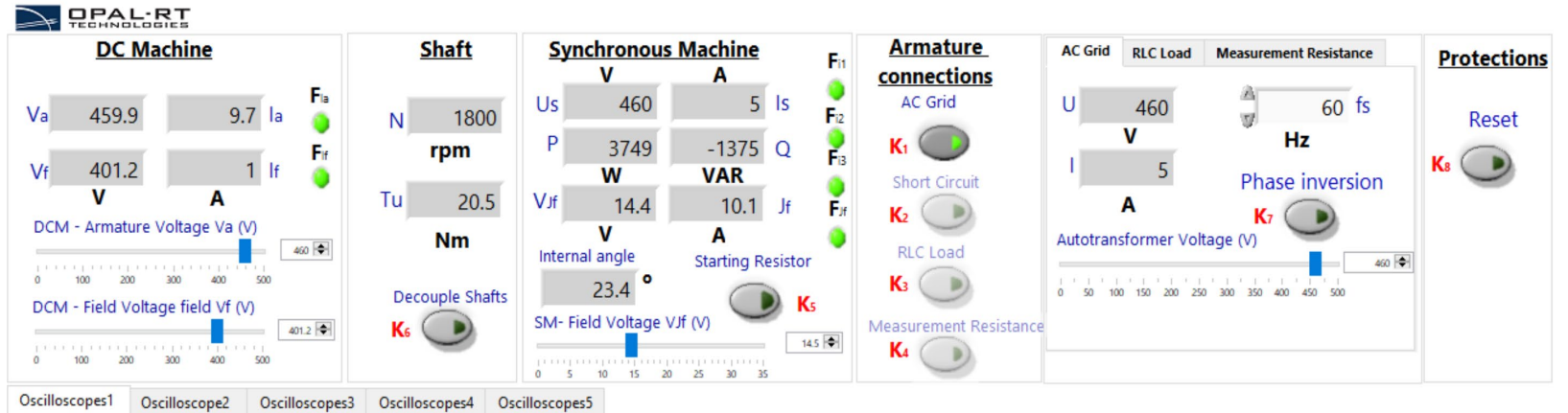
Topic	Suggested Lab Sessions
Synchronous Machine	Parameters Identification
	Generator Mode Feeding Passive Load
	Generator Mode Connected to Grid
	Motor Mode
	Faults and Recovery
Asynchronous Machine	Transformer and Frequency Converter
	Parameters Identification
	Speed Control with Variable Voltage
	Speed Control with Variable Resistance
	Speed Control with Three-phase Inverter

## Features

- Scope: Trigger, Memory, y-scale & y-offset
- Nameplate & Ratings
- Protection: Fuse & Reset
- Parameters Identification
- Operation Mode: Generator & Motor
- Connection to Grid: Synchronization & Loss of Synchronism
- V-Curves
- Passive & Active Loads
- Faults Tests: Short-circuit Currents & Recovery Voltages
- Selecting Frequency: 50/60 Hz
- Power Computation

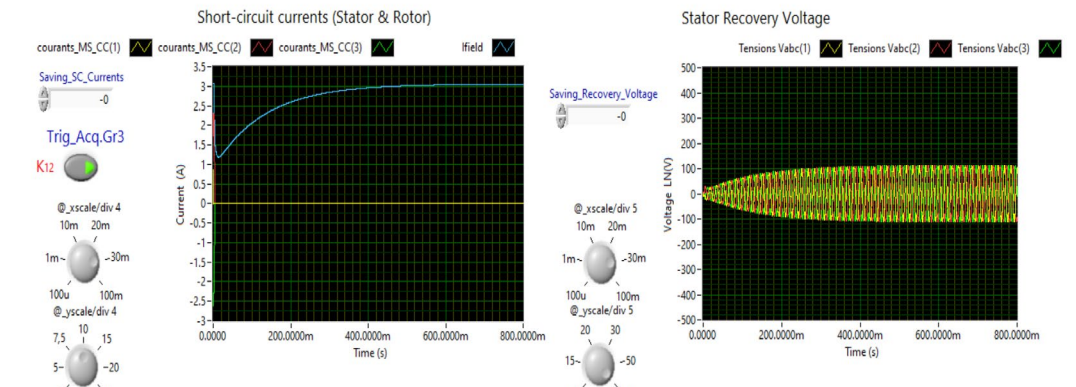
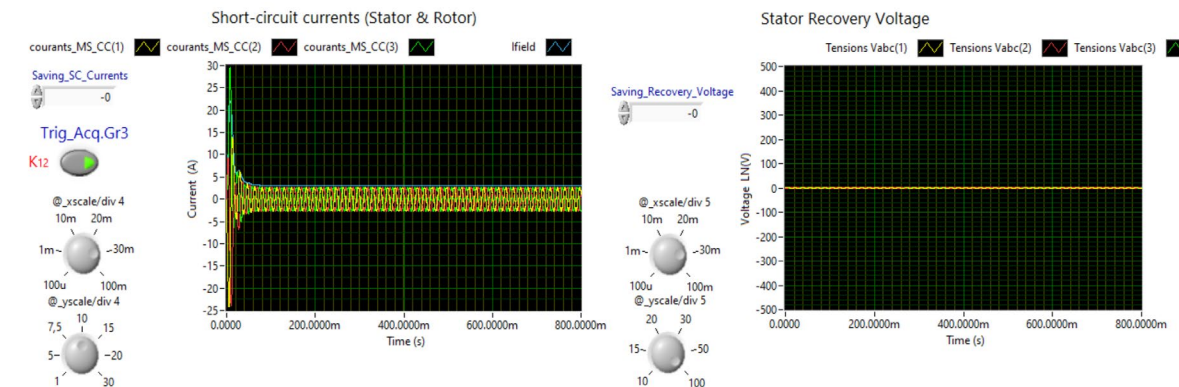
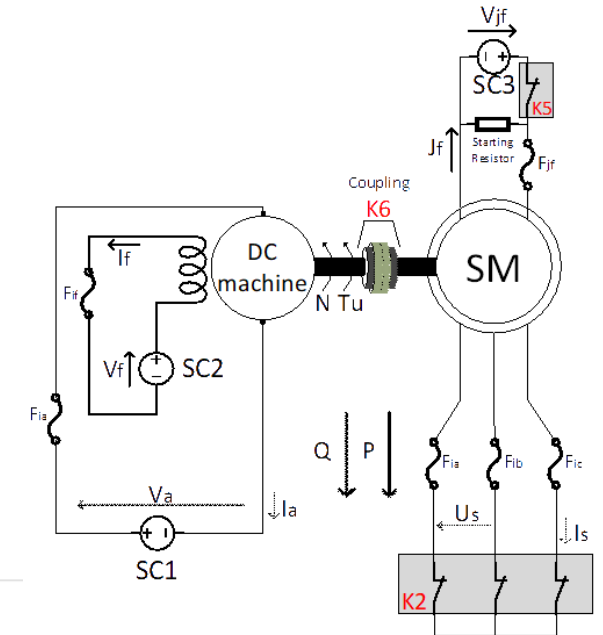
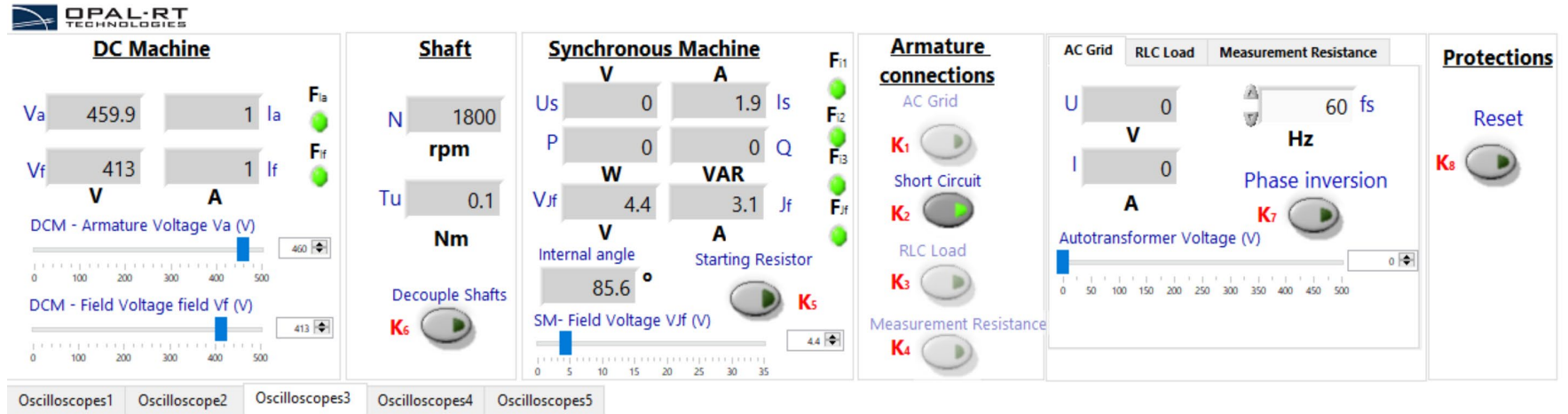


## Connection to Grid: Power Exchange, Internal angle limits, Motor & Generator Mode





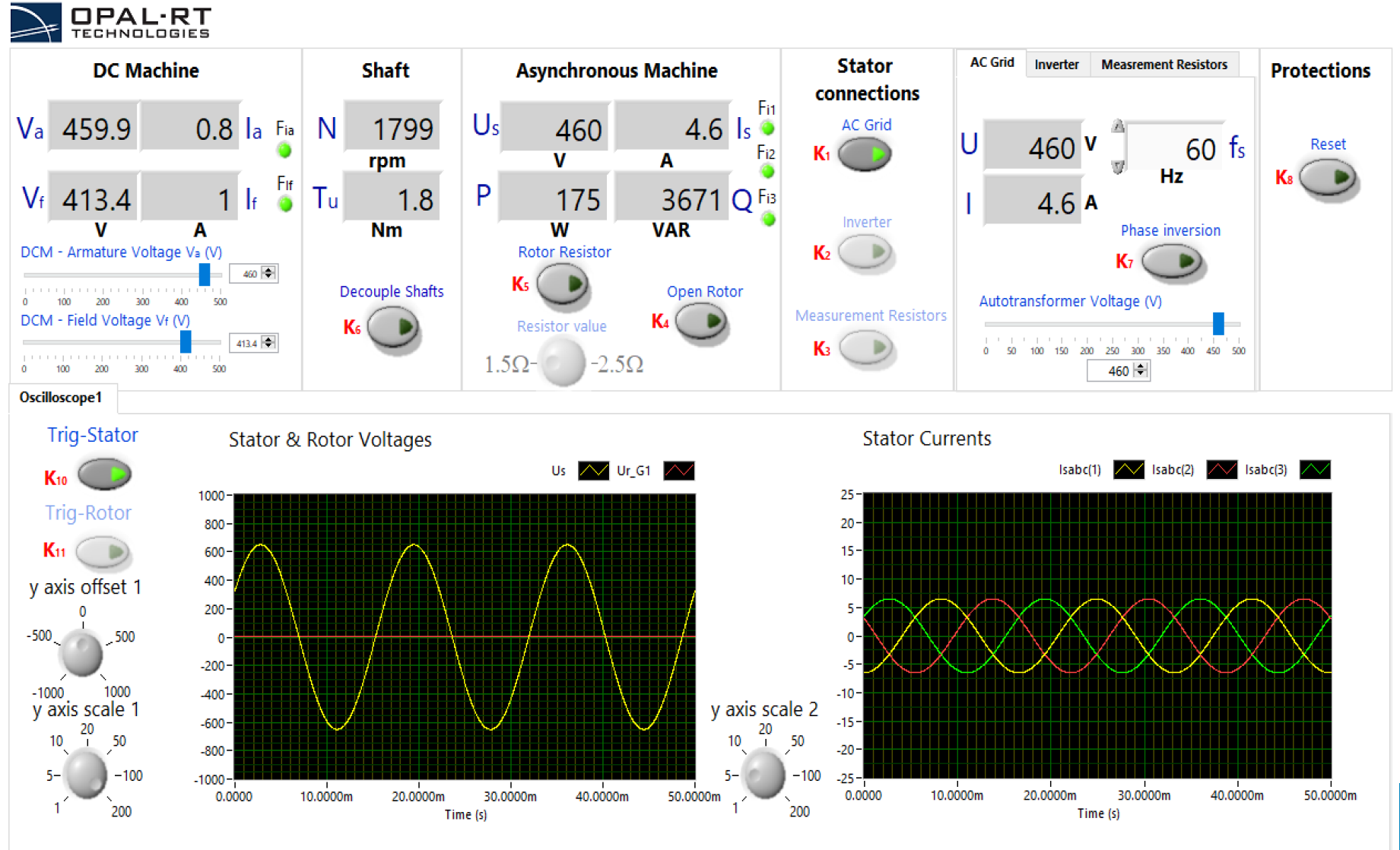
## Faults Tests: Short-circuit Currents & Recovery Voltages



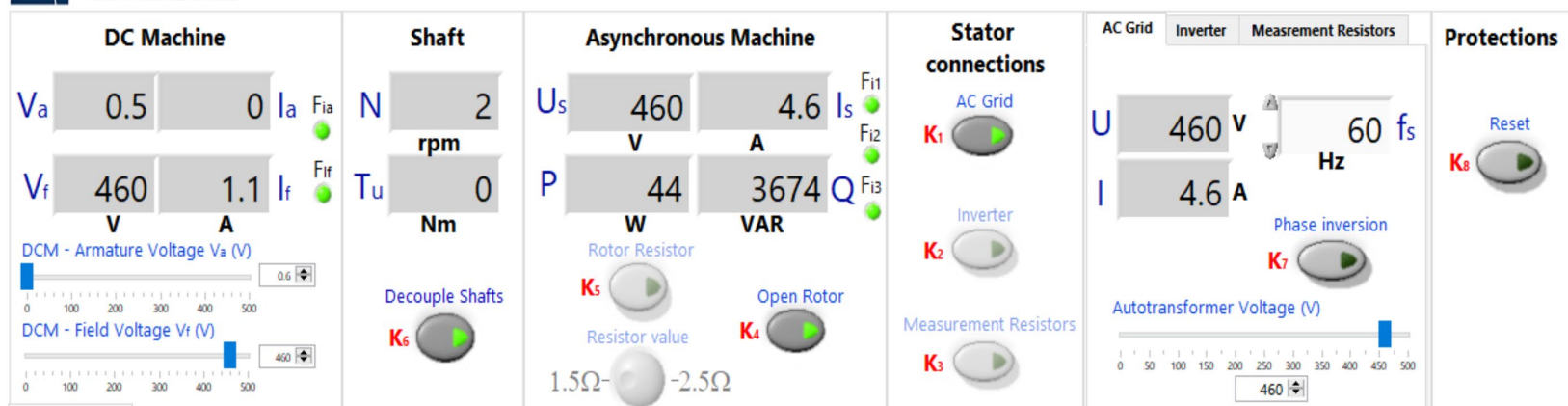


## Features

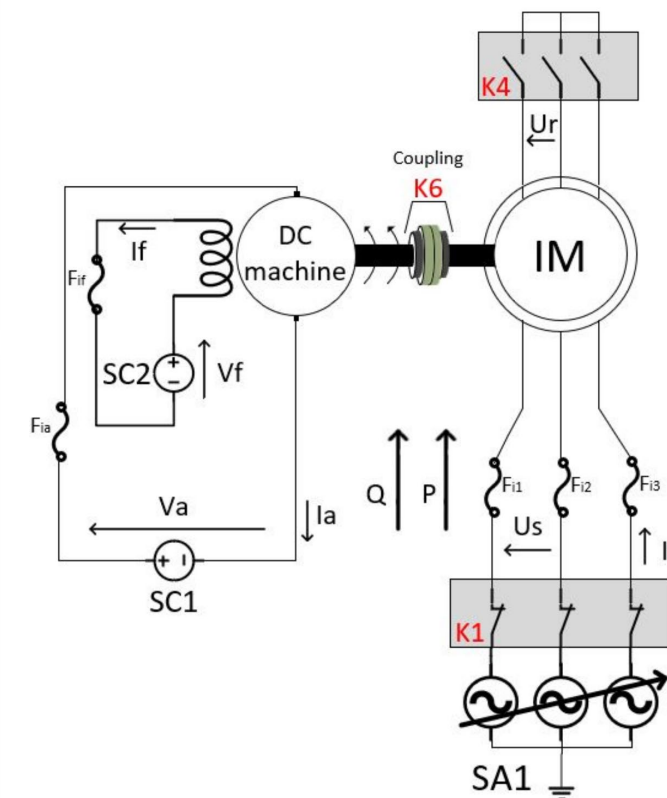
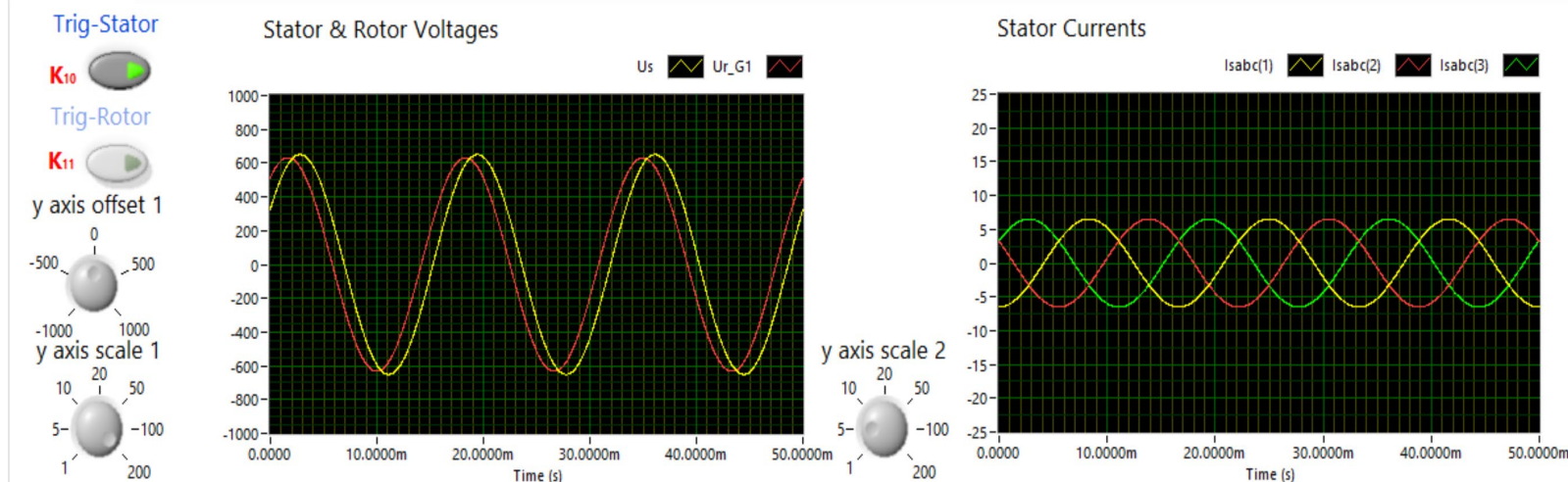
- Scope: Trigger, Memory, y-scale & y-offset
- Nameplate & Ratings
- Protection: Fuse & Reset
- Parameters Identification
- Transformer & Frequency Converter
- Motor Mode
- Speed Control with: Variable Resistor, Variable Voltage & Three-phase Inverter
- Selecting Frequency: 50/60 Hz
- Power Computation



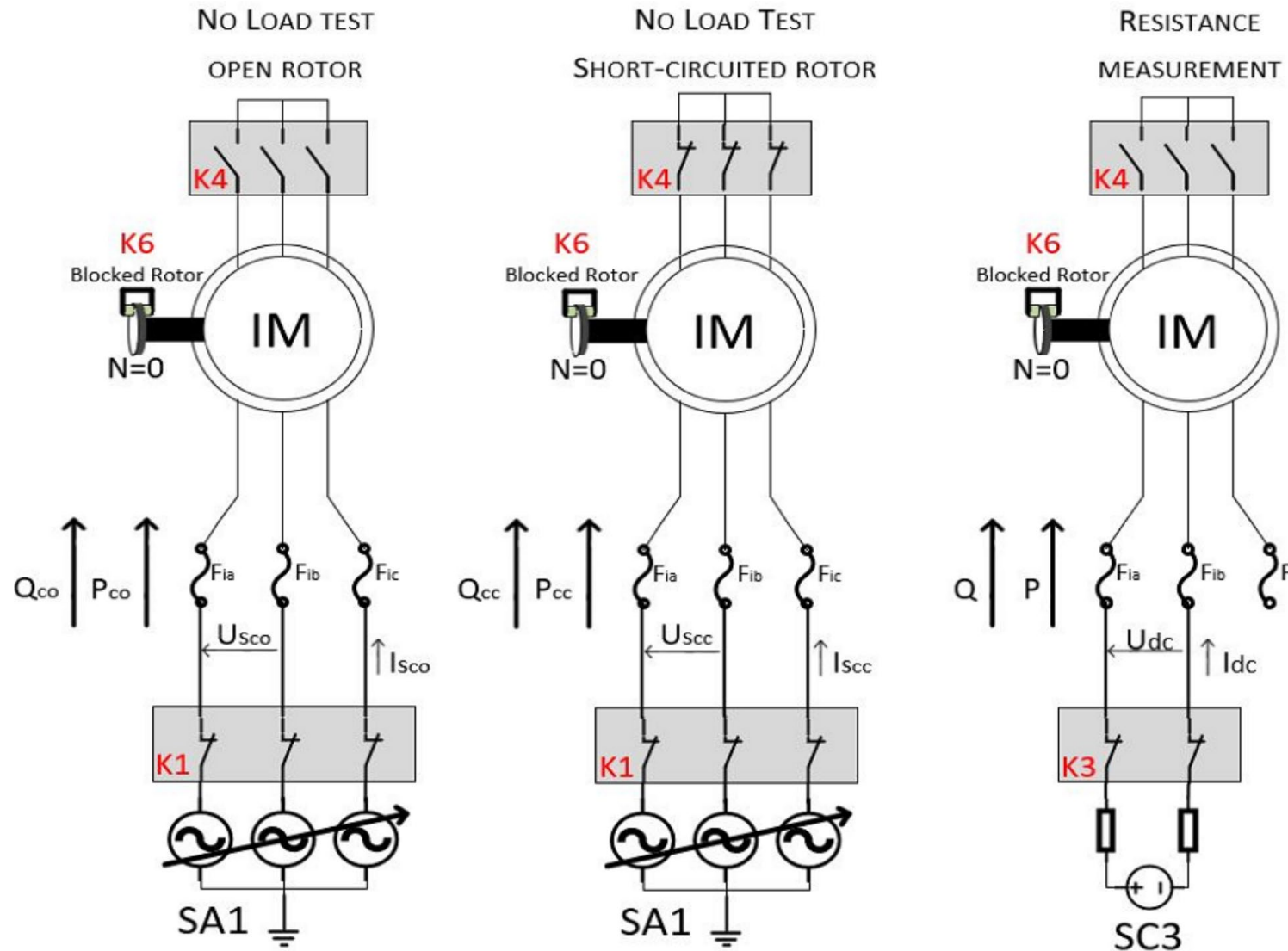
## Transformer & Frequency Converter



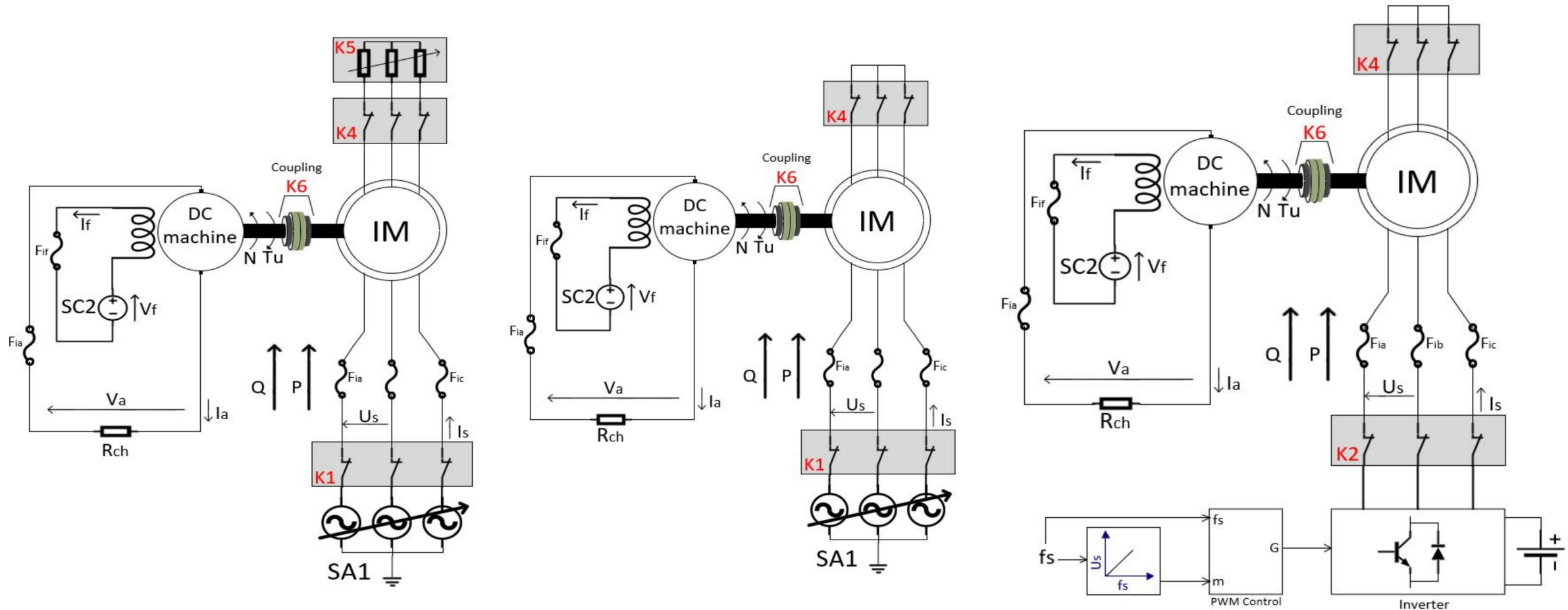
Oscilloscope1



## Parameters Identification



## Speed Control: Variable Voltage, Variable Resistor & Three-Phase Inverter

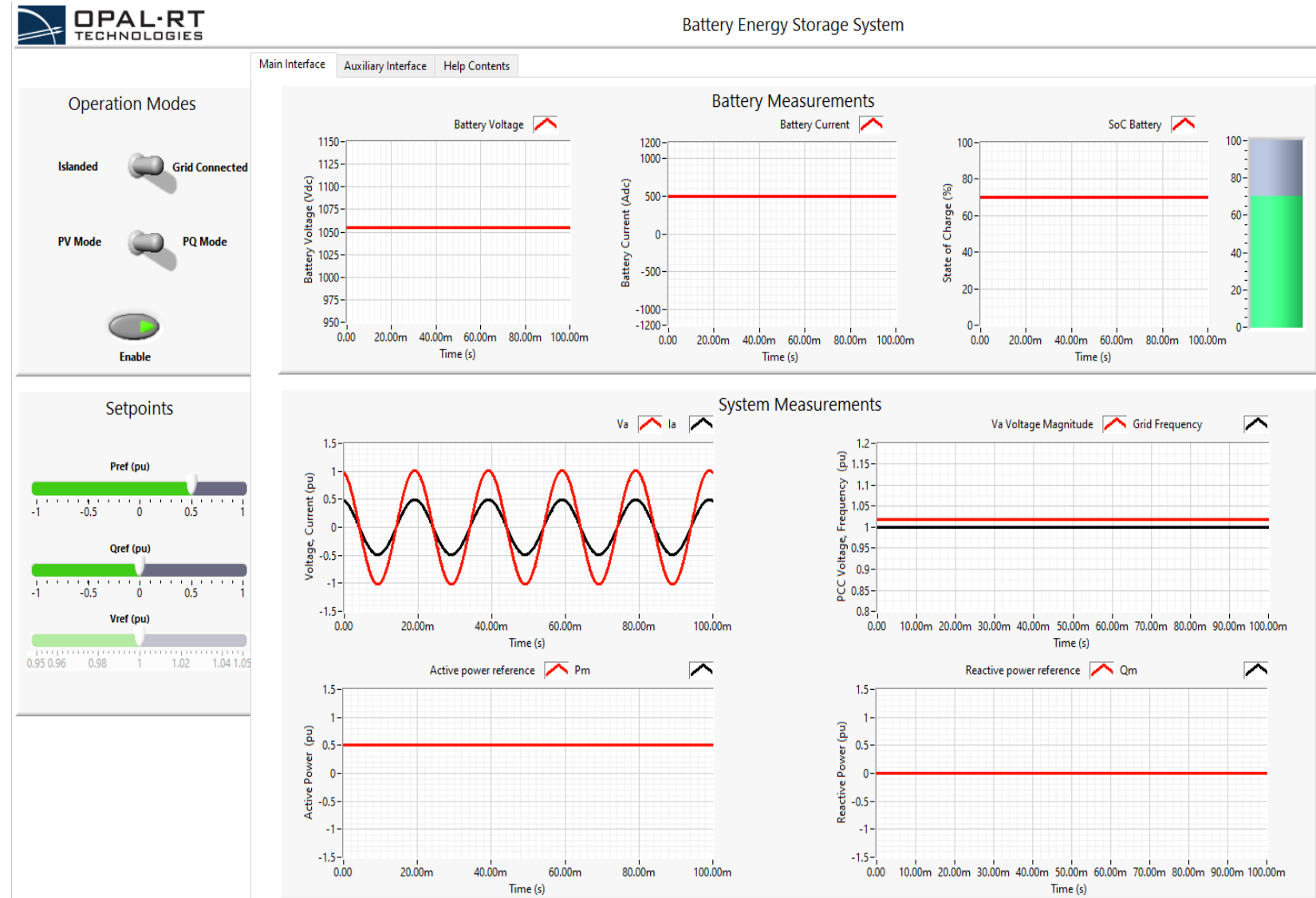


Topic	Suggested Lab Sessions
Battery Energy Storage	Grid Connected & Islanded
	PV & PQ Modes
	Interactive Help
Photovoltaic Generation System	Curtail & MPPT
	Setpoints: Irradiance, P & Q
	Interactive Help
Wind Turbine Generation System	Rotor & Grid Sides Controllers: Back-to-Back Converter
	Setpoints: Wind speed, Id & Iq
	Interactive Help
Micro Grid	All items cited above
	Power Flow Computation
	Microgrid Controller
	Load: Critical, Partially/Fully Sheddable. Demand Response. 24-hour Profile
	Interactive Help



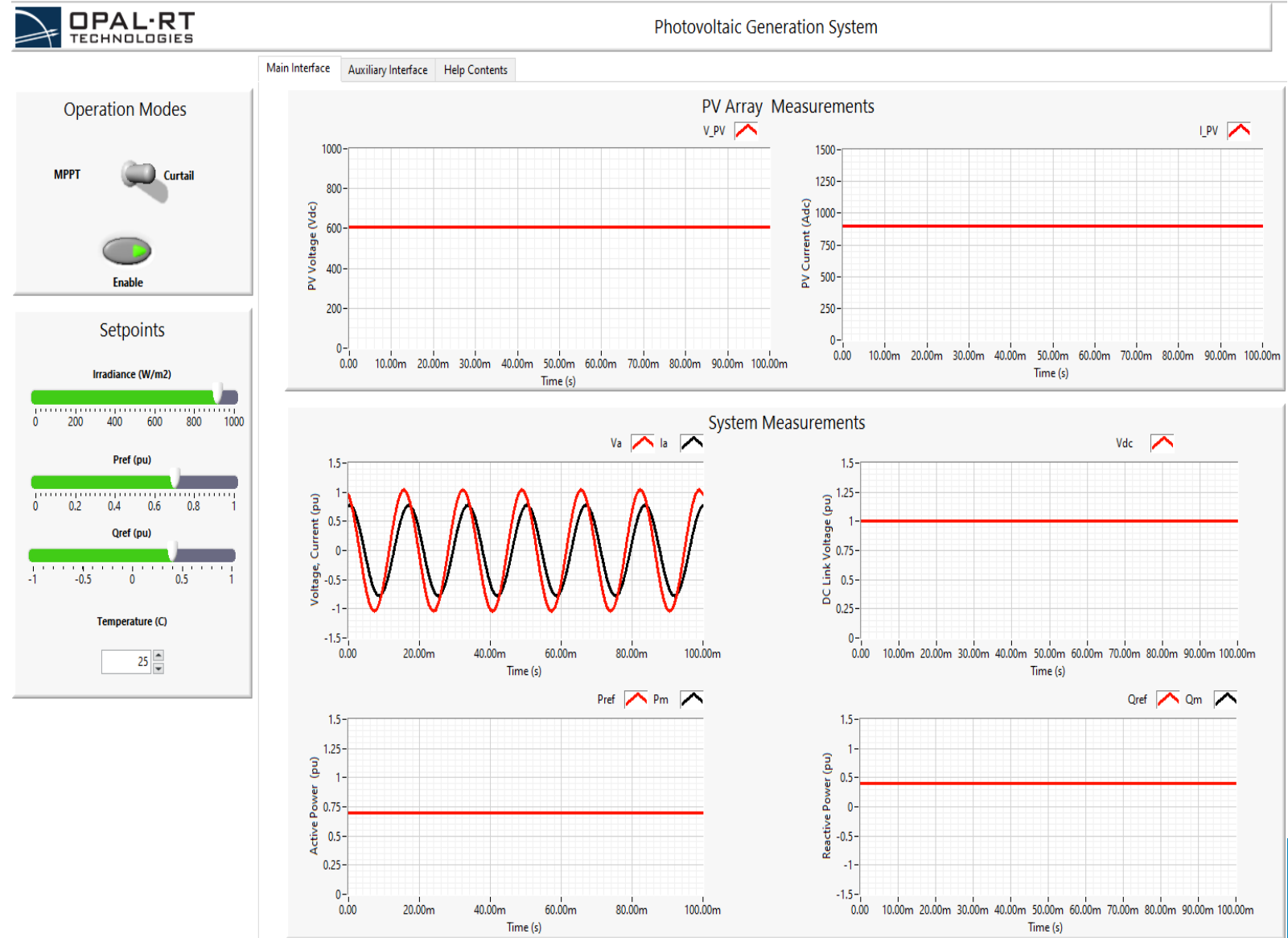
## Features

- Scopes for waveforms' display
- Varying active power reference
- Varying reactive power reference
- Varying voltage reference
- "PQ" and "PV" modes of operation
- Grid following, operation mode when connected to grid
- Grid forming, islanding operation mode
- Power flow computation
- Interactive Help with live displays of currents, voltages, and power flow



## Features

- Scopes for waveforms' display
- Varying solar irradiance
- Varying active power reference
- Varying reactive power reference
- Varying temperature
- Curtail operation mode
- Maximum power point tracking (MPPT) operation mode
- Power flow computation
- Interactive Help with live displays of currents, voltages, and power flow

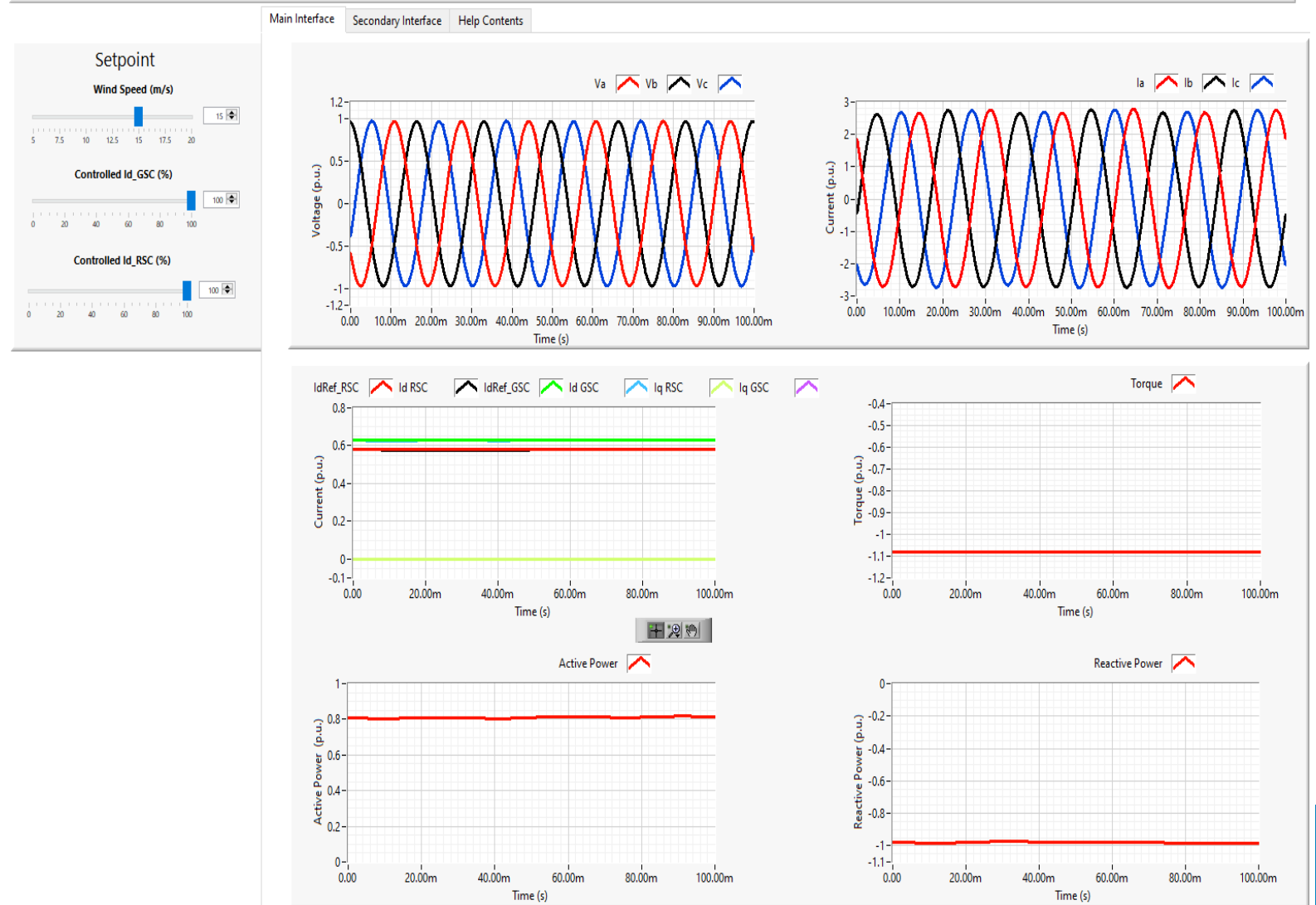


## Features

- Scopes for waveforms' display
- Varying wind speed
- Type 3 Wind Turbine
- Doubly-Fed Induction Generator (DFIG) with rotor and grid sides controllers
- Back-to-back converters
- Varying reference current Power flow computation
- Interactive Help with live displays of currents, voltages, and power flow



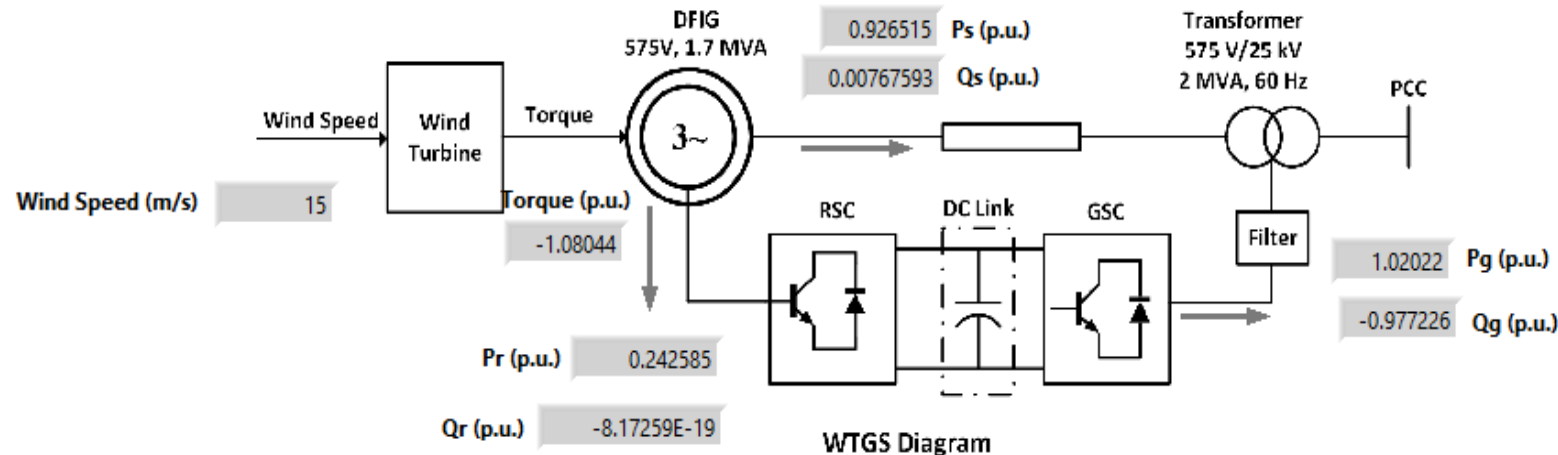
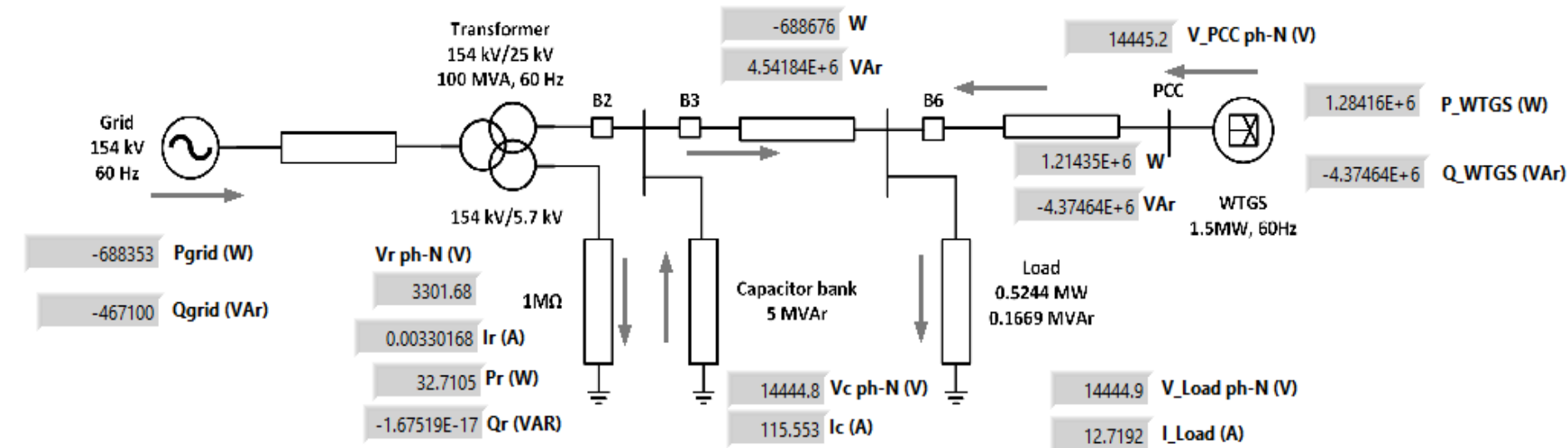
Wind Turbine Generation System



# RENEWABLE ENERGY

Power Electronics  
Electric Machines  
**Renewable Energy**  
Fundamentals Elec. Eng.  
Motor Drives

Battery Energy Storage  
Photovoltaic Generation  
**Wind Turbine Generation**  
Microgrid



**Notes:** 1-The  $V_{abc}$  and  $I_{abc}$  signals shown in the main interface are measured at the low side voltage of the transformer right before the Point of Common Coupling (PCC).

2- The active and reactive powers shown in the main interface are computed at the PCC.

3-  $I_q$  references are set at zero.

4- Controlled  $I_{d\_GSC}$  is the ratio of  $I_d$  reference over the  $I_d$  nominal for the grid side controller. Similar definition applies for the controlled  $I_{d\_RSC}$ .

RSC: Rotor Side Converter  
GSC: Grid Side Converter

# RENEWABLE ENERGY

Power Electronics  
Electric Machines  
**Renewable Energy**  
Fundamentals Elec. Eng.  
Motor Drives

Battery Energy Storage  
Photovoltaic Generation  
Wind Turbine Generation  
**Microgrid**



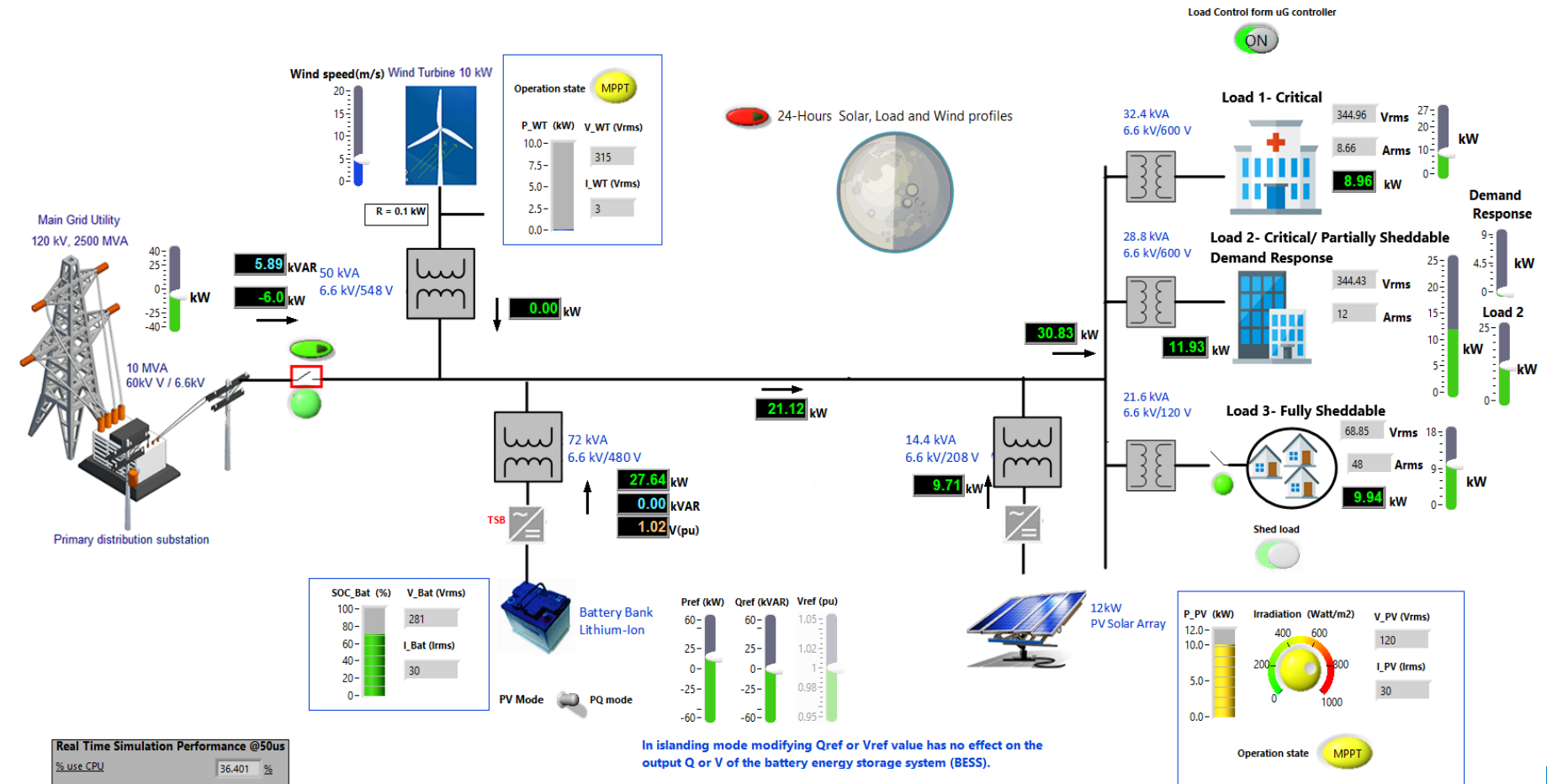
## Features of Microgrid Model

- Varying solar irradiance
- Varying wind speed
- Varying reactive power reference
- Varying load demand
- Varying voltage reference
- Maximum power point tracking (MPPT) operation mode
- Microgrid (uG) controller
- Varying Demand response
- Load shedding
- Power flow computation
- Two operation modes: connected to grid and islanding
- Acquisition panels for waveform's display of the wind turbine, PVGS and BESS
- 24-hours load, wind speed and solar irradiance profiles to automatically change varying parameters
- Real scope feature: y-scale divisions

uG testbench | HIL microgrid controller



## Real-time simulation of a Small Scaled Micro-Grid with a uG controller

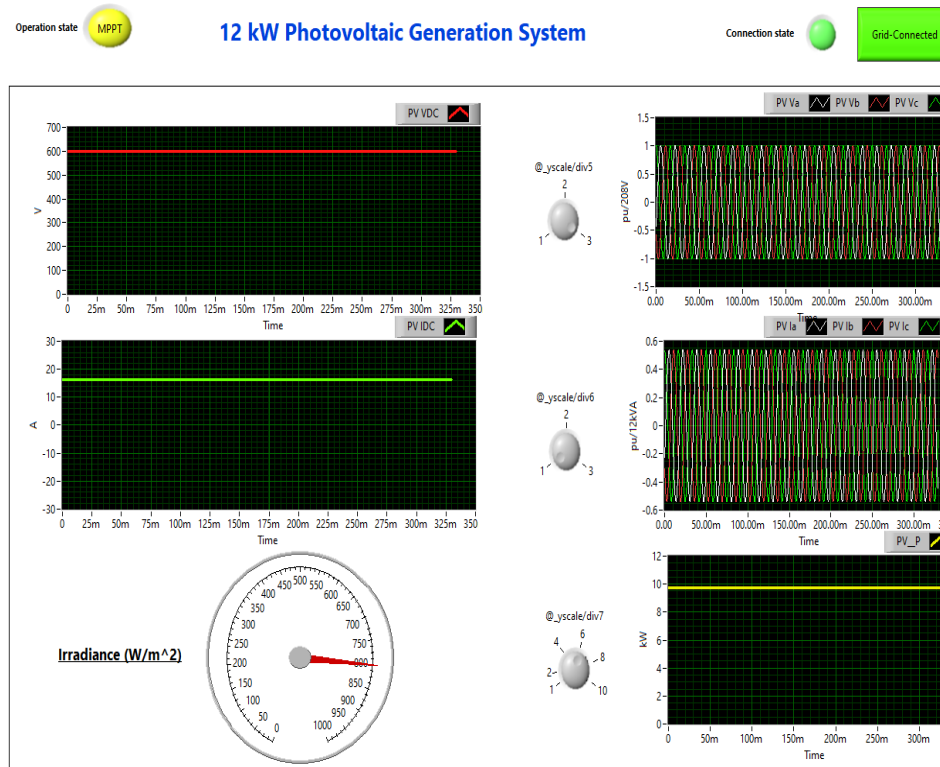




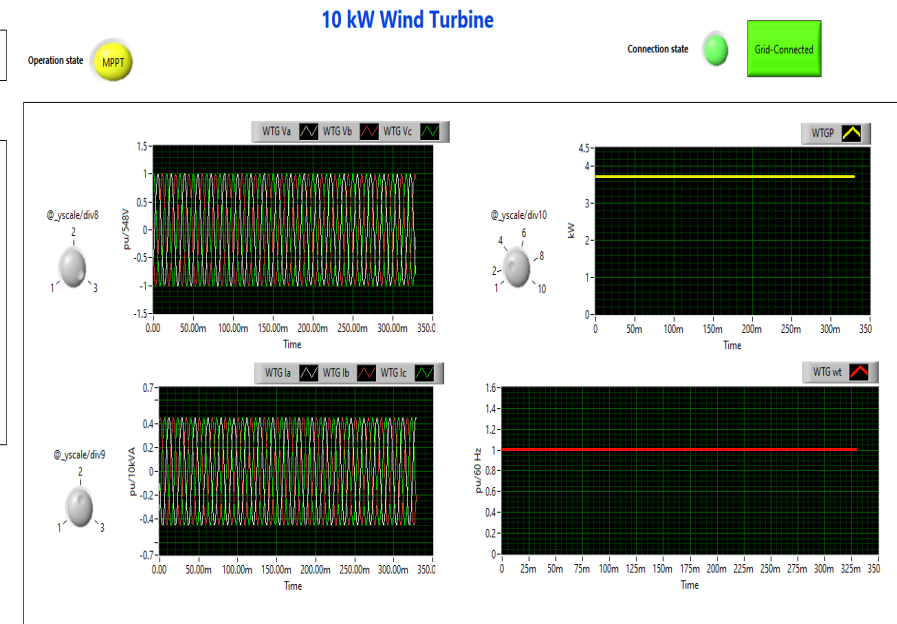
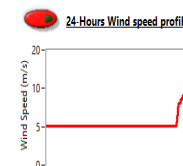
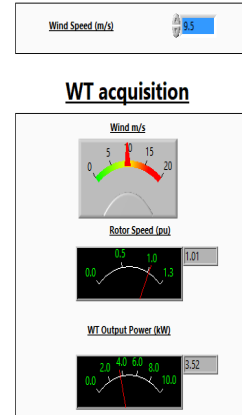
# RENEWABLE ENERGY

Power Electronics  
Electric Machines  
**Renewable Energy**  
Fundamentals Elec. Eng.  
Motor Drives

Battery Energy Storage  
Photovoltaic Generation  
Wind Turbine Generation  
**Microgrid**



## WT Control



Topic	Suggested Lab Sessions
Measurement & Instruments	Scope
	RMS, Max, Mean
Electric Circuits	Steady-state
	Instantaneous, Sinusoidal & Frequency Response
	P, Q, Power Factor
Electric Engineering	Single-phase
	Three-phase: balanced & unbalanced
	Power Factor Compensation
Single-phase Transformer	Parameters Identification: no-load, short-circuit
	Saturation
Three-phase Transformer	Parameters Identification: no-load, short-circuit
	Saturation
	Internal Connection: wye-delta, alpha-numeric code

**OPAL-RT**  
TECHNOLOGIES

Réseau et Transformateur Charge Passive

Fondamentale Harmoniques

f [Hz] 60

A V<sub>LN</sub> [V] 460

B V<sub>LN</sub> [V] 460 Phase B 120

C V<sub>LN</sub> [V] 460 Phase C -120

Mise sous tension Déphasage mise sous tension

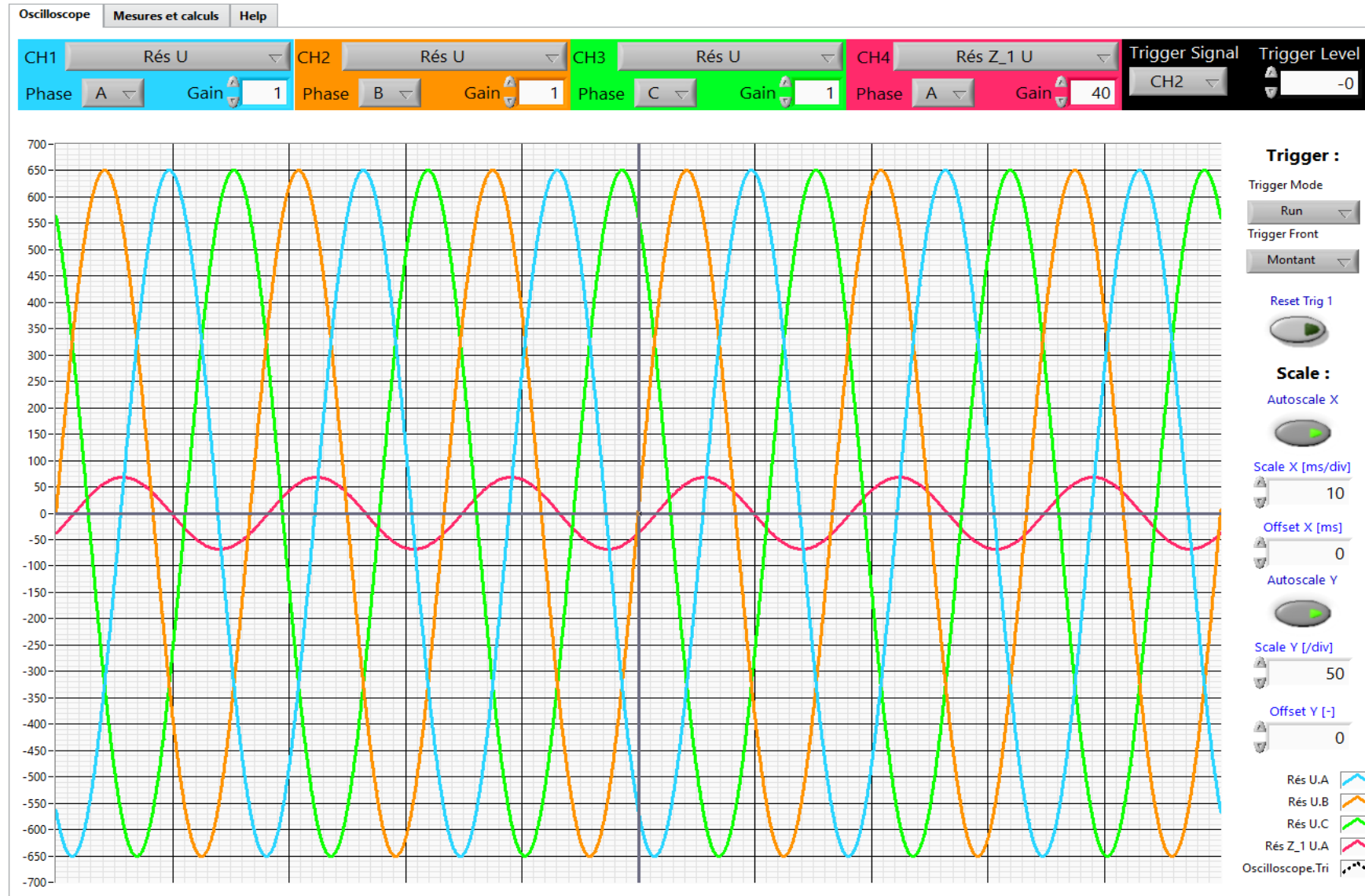
Inversion Phases Réseau Monophasé Phases équilibrées

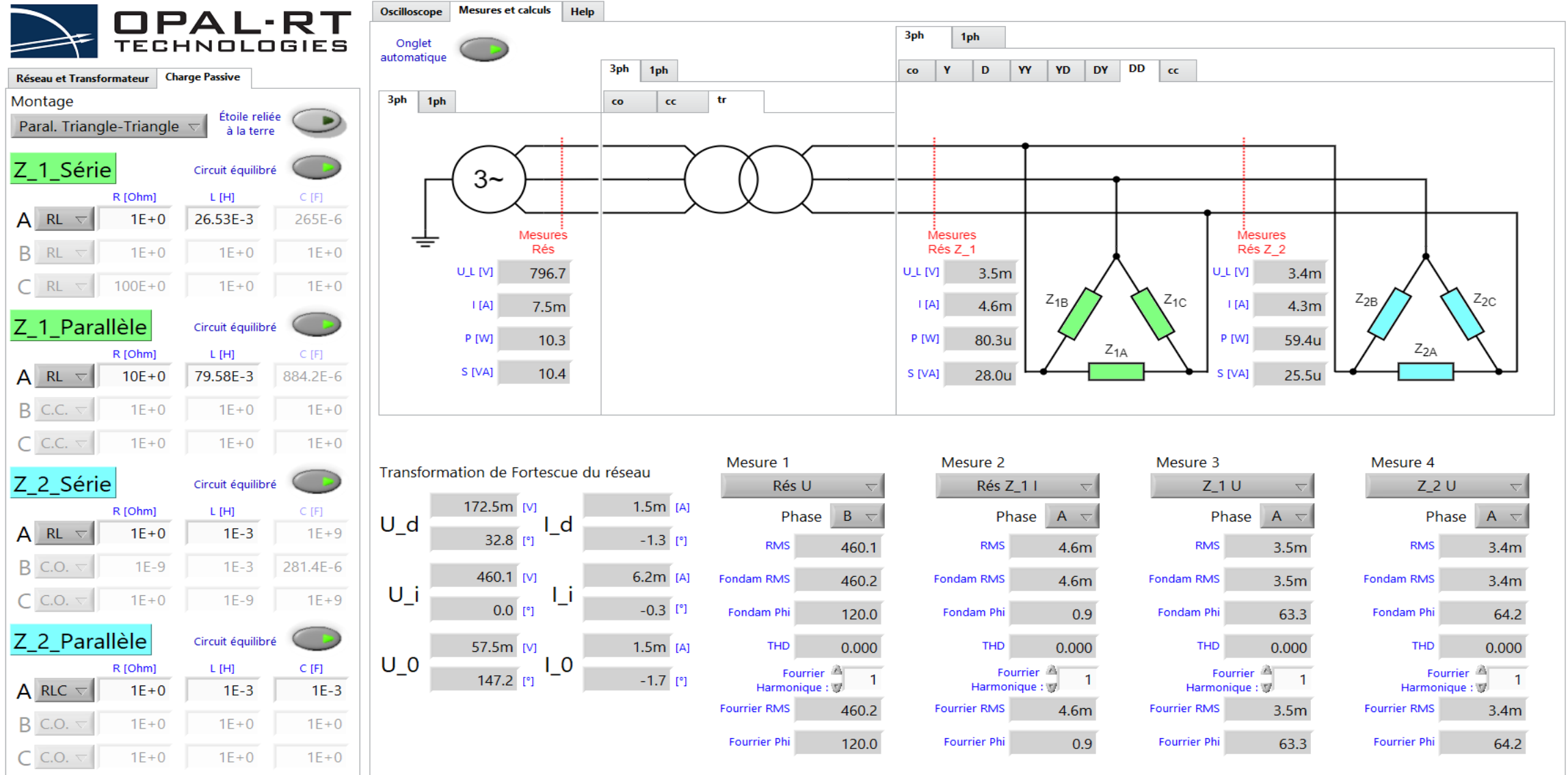
Transformateur <3> MAT primaire MAT secondaire


Disjoncteur : L<sub>n</sub> [A] 16 Disjoncteur Thermique Magnétique Commande Reset Therm Sans protection

Mode Thermique Classe 10 > 10s à 7.2 \* I<sub>n</sub>

Mode Magnétique Z : 2.4 \* I<sub>n</sub>





**OPAL-RT**  
TECHNOLOGIES

Réseau et Transformateur

Charge Passive

Fondamentale

Harmoniques

f [Hz]

60

A

V<sub>LN</sub> [V]

460

B

V<sub>LN</sub> [V]

460

Phase B

120

C

V<sub>LN</sub> [V]

460

Phase C

-120

Mise sous tension

Inversion Phases

Réseau Monophasé équilibré

Phases équilibrées

Déphasage mise sous tension

-0

Transformateur

MAT primaire

MAT secondaire

<3>

Disjoncteur :

I<sub>n</sub> [A]

16

Disjoncteur

Thermique

Magnétique

Commande

Reset Therm

Sans protection

Mode Thermique

Classe 10 > 10s à 7.2 \* I<sub>n</sub>

Mode Magnétique

Z : 2.4 \* I<sub>n</sub>

Oscilloscope

Mesures et calculs

Help

Onglet automatique

3ph

1ph

co

cc

tr

3ph

1ph

co

Y

D

YY

YD

DY

DD

cc

1~

Mesures Rés A

U [V]

460.0

I [A]

8.5m

P [W]

3.9

S [VA]

3.9

T flux [Wb]

1.3m

Mesures Rés Z<sub>1</sub> A

U [V]

77.3

I [A]

2.3m

Z<sub>1A</sub>

Z<sub>2B</sub>

Z<sub>2C</sub>

Z<sub>1B</sub>

Z<sub>2A</sub>

Z<sub>1C</sub>

Transformation de Fortescue du réseau

Mesure 1

Mesure 2

Mesure 3

Mesure 4

U<sub>d</sub>

153.3 [V]

I<sub>d</sub>

2.7m [A]

U<sub>i</sub>

153.3 [V]

I<sub>i</sub>

2.7m [A]

U<sub>0</sub>

153.3 [V]

I<sub>0</sub>

3.0m [A]

U<sub>d</sub>

0.0 [°]

I<sub>d</sub>

-1.1 [°]

U<sub>i</sub>

0.0 [°]

I<sub>i</sub>

-1.1 [°]

U<sub>0</sub>

0.0 [°]

I<sub>0</sub>

-0.8 [°]

Rés U

Phase B

RMS

0.0

Fondam RMS

0.0

Fondam Phi

0.0

THD

0.000

Fourrier Harmonique :

1

Fourrier RMS

0.0

Fourrier Phi

0.0

Rés Z<sub>1</sub> I

Phase A

RMS

2.3m

Fondam RMS

2.3m

Fondam Phi

1.6

THD

0.000

Fourrier Harmonique :

1

Fourrier RMS

2.3m

Fourrier Phi

1.6

Z<sub>1</sub> U

Phase A

RMS

23.0m

Fondam RMS

23.0m

Fondam Phi

53.5

THD

0.000

Fourrier Harmonique :

1

Fourrier RMS

23.0m

Fourrier Phi

53.5

Z<sub>2</sub> U

Phase A

RMS

46.2

Fondam RMS

46.2

Fondam Phi

1.1

THD

0.000

Fourrier Harmonique :

1

Fourrier RMS

46.2

Fourrier Phi

1.1



ver.1- 31 mars 2022

## Z\_1\_Série

R [Ohm]	X_L [Ohm]	X_C [Ohm]
1.0	10.0	2.7m
1.0	10.0	2.7m
1.0	10.0	2.7m

## Z\_1\_Parallèle

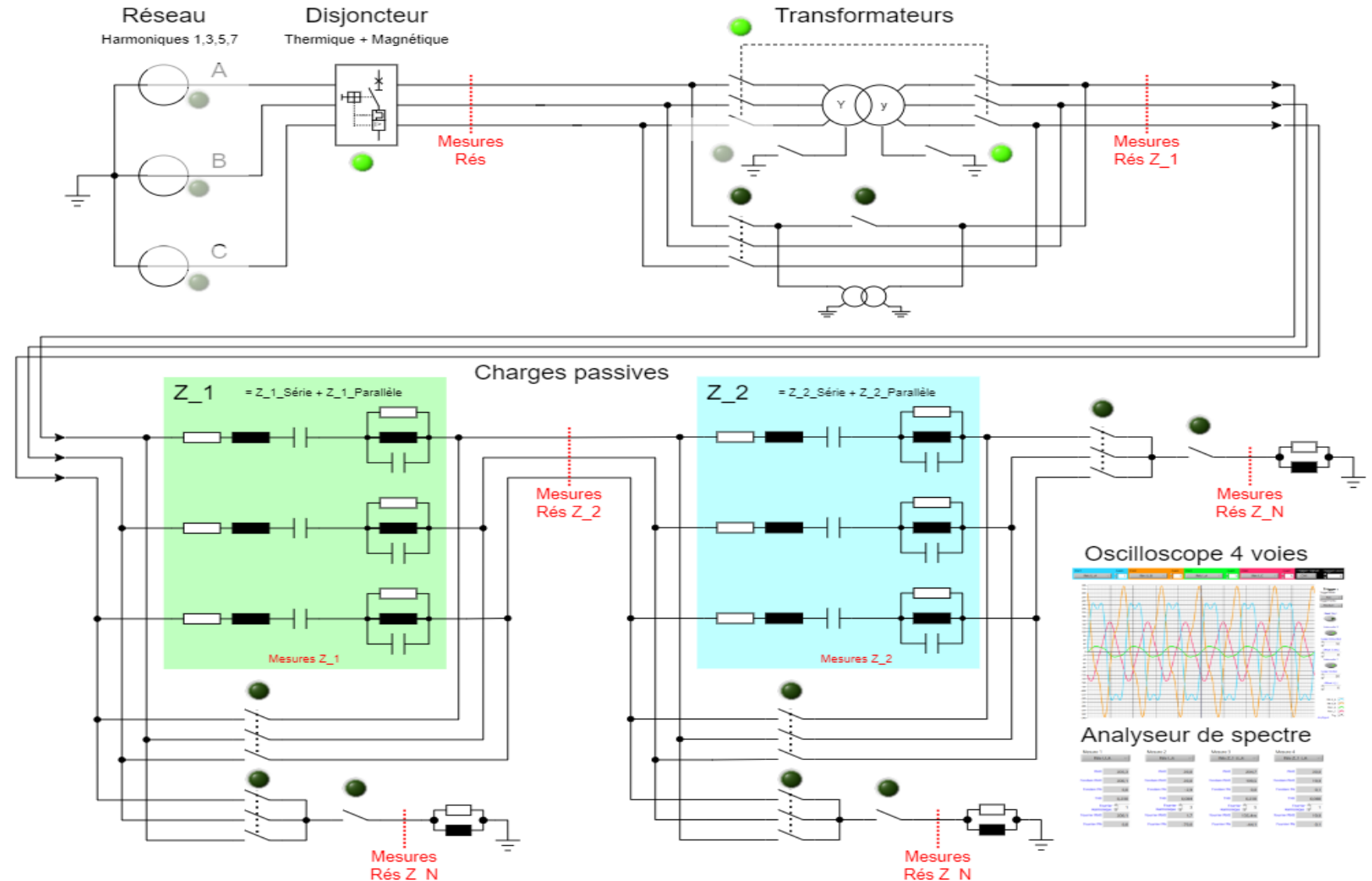
R [Ohm]	X_L [Ohm]	X_C [Ohm]
10.0	30.0	2.7M
10.0	30.0	2.7M
10.0	30.0	2.7M

## Z\_2\_Série

R [Ohm]	X_L [Ohm]	X_C [Ohm]
1.0u	377.0n	2.7m
1.0u	377.0n	2.7m
1.0u	377.0n	2.7m

## Z\_2\_Parallèle

R [Ohm]	X_L [Ohm]	X_C [Ohm]
1.0u	377.0	2.7M
1.0u	377.0	2.7M
1.0u	377.0	2.7M



Réseau et Transformateur

Charge Passive

Fondamentale

Harmoniques

f [Hz]

60

A

V<sub>LN</sub> [V]

400

B

V<sub>LN</sub> [V]

460

Phase B

120

C

V<sub>LN</sub> [V]

460

Phase C

-120

Mise sous tension

Inversion Phases

Réseau Monophasé

Phases équilibrées

-0

Déphasage mise sous tension

Transformateur

MAT primaire

MAT secondaire

Transformateur

Disjoncteur :

L<sub>n</sub> [A]

16

Disjoncteur

Thermique

Magnétique

Reset Therm

Sans protection

Mode Thermique

Classe 20 > 20s à 7.2 \* I<sub>n</sub>

Mode Magnétique

B : 3 \* I<sub>n</sub>

Oscilloscope

Mesures et calculs

Help

Onglet automatique

3ph

1ph

co

Y

D

YY

YD

DY

DD

cc

3ph

1ph

co

cc

tr

1~

Mesures Rés A

U [V]

400.0

I [A]

521.2

P [W]

195.3k

S [VA]

208.5k

T flux [Wb]

792.9m

Mesures Rés Z\_1 A

U [V]

505

I [A]

15.3

Transformation de Fortescue du réseau

Mesure 1

Mesure 2

Mesure 3

Mesure 4

U<sub>d</sub>

133.3 [V]

89.6 [A]

0.0 [°]

-20.5 [°]

U<sub>i</sub>

133.3 [V]

89.6 [A]

0.0 [°]

-20.5 [°]

U<sub>0</sub>

133.3 [V]

342.0 [A]

0.0 [°]

-20.5 [°]

I<sub>d</sub>

0.0 [°]

-20.5 [°]

I<sub>i</sub>

0.0 [°]

-20.5 [°]

I<sub>0</sub>

0.0 [°]

-20.5 [°]

Rés U

Phase B

RMS

0.0

Fondam RMS

0.0

Fondam Phi

0.0

THD

0.000

Fourier Harmonique :

1

Fourier RMS

0.0

Fourier Phi

0.0

Rés Z\_1 I

Phase A

RMS

504.8

Fondam RMS

504.8

Fondam Phi

-20.4

THD

0.000

Fourier Harmonique :

1

Fourier RMS

504.8

Fourier Phi

-20.4

Z\_1 U

Phase A

RMS

3.4m

Fondam RMS

3.4m

Fondam Phi

31.4

THD

0.000

Fourier Harmonique :

1

Fourier RMS

3.4m

Fourier Phi

31.4

Z\_2 U

Phase A

RMS

2.9

Fondam RMS

2.9

Fondam Phi

-21.0

THD

0.000

Fourier Harmonique :

1

Fourier RMS

2.9

Fourier Phi

-21.0

**Réseau et Transformateur** Charge Passive

Fondamentale Harmoniques

f [Hz] 60

V<sub>LN</sub> [V] 460

A V<sub>LN</sub> [V] 460 Phase B 120

B V<sub>LN</sub> [V] 460 Phase C -120

C V<sub>LN</sub> [V] 460

Mise sous tension Inversion Phases Réseau Monophasé équilibrées Phases

Déphasage mise sous tension -0

Transformateur MAT primaire MAT secondaire

Transformateur

Disjoncteur : I<sub>n</sub> [A] 21 Disjoncteur Thermique Commande Magnétique Reset Therm Sans protection

Mode Thermique Classe 10 > 10s à 7.2 \* I<sub>n</sub>

Mode Magnétique Z : 2.4 \* I<sub>n</sub>

Oscilloscope Mesures et calculs Help

Onglet automatique

3ph 1ph

co cc tr

3~

Mesures Rés

U<sub>L</sub> [V] 796.7

I [A] 4.3

P [W] 128.5

S [VA] 5.9k

3ph 1ph

co Y D YY YD DY DD cc

Mesures Rés Z<sub>1</sub>

U<sub>L</sub> [V] 821.4

I [A] 42.7m

P [W] 60.8

S [VA] 60.8

Transformation de Fortescue du réseau

U<sub>d</sub> 172.4m [V] 176.8 [°]

I<sub>d</sub> 3.5m [A] -30.0 [°]

U<sub>i</sub> 460.1 [V] 0.0 [°]

I<sub>i</sub> 4.3 [A] -88.7 [°]

U<sub>0</sub> 57.5m [V] 3.2 [°]

I<sub>0</sub> 3.1m [A] 7.5 [°]

Mesure 1 Rés U Phase B RMS 460.1 Fondam RMS 460.1 Fondam Phi 120.0 THD 0.000 Fourier Harmonique : 1 Fourier RMS 460.1 Fourier Phi 120.0

Mesure 2 Rés Z<sub>1</sub> I Phase A RMS 42.6m Fondam RMS 42.7m Fondam Phi 0.2 THD 0.000 Fourier Harmonique : 1 Fourier RMS 42.7m Fourier Phi 0.2

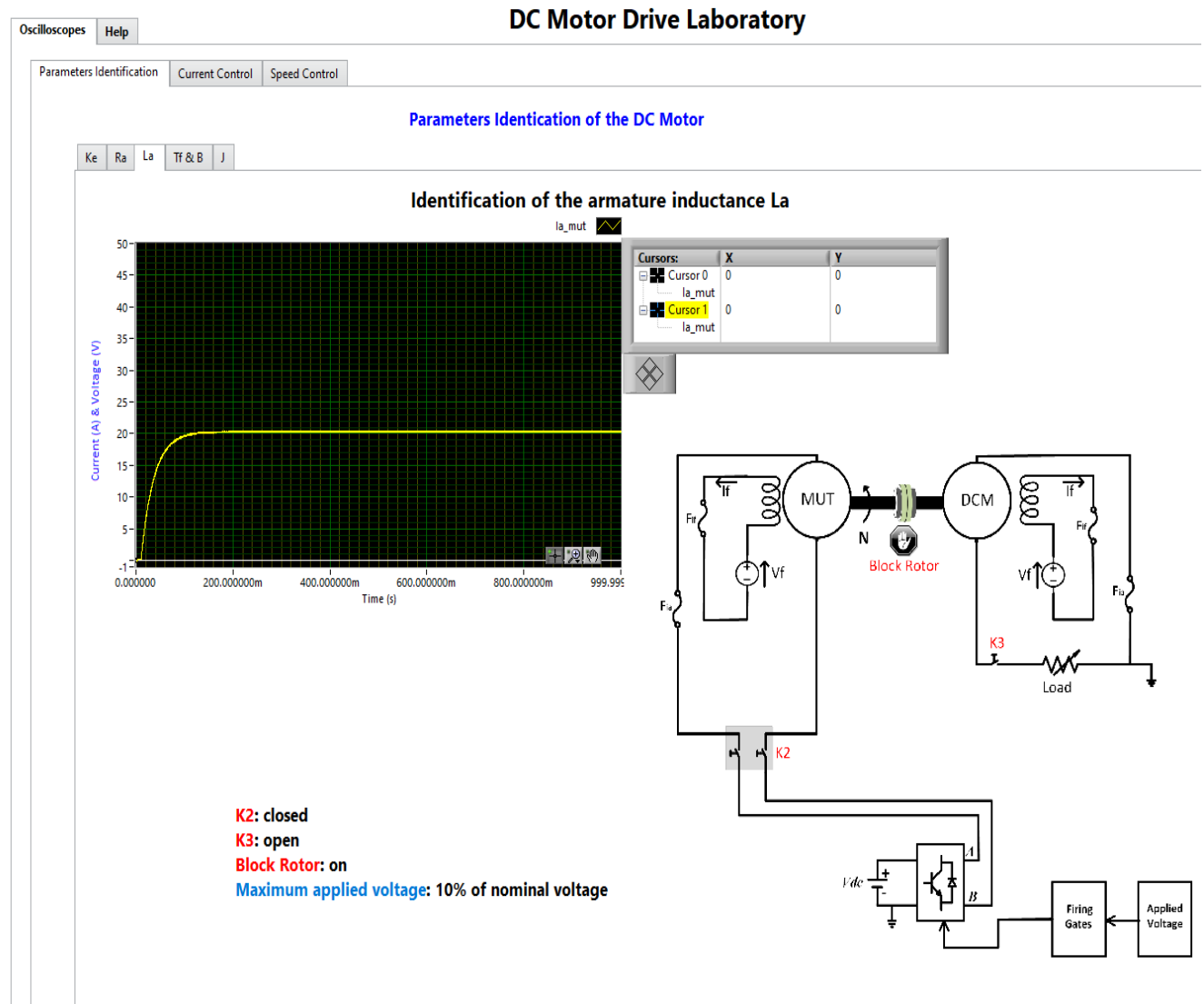
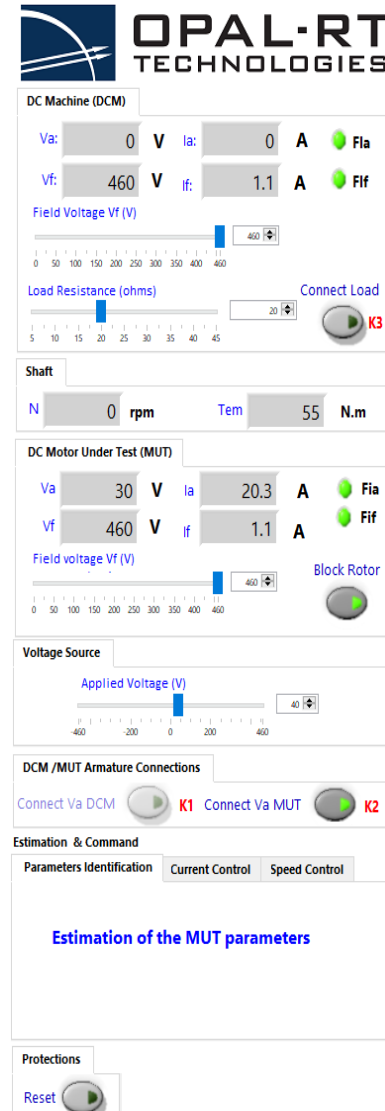
Mesure 3 Z<sub>1</sub> U Phase A RMS 518.3m Fondam RMS 510.3m Fondam Phi 59.6 THD 0.000 Fourier Harmonique : 1 Fourier RMS 510.3m Fourier Phi 59.6

Mesure 4 Z<sub>2</sub> U Phase A RMS 0.0 Fondam RMS 32.8u Fondam Phi -70.4 THD 0.000 Fourier Harmonique : 1 Fourier RMS 32.8u Fourier Phi -70.4

Topic	Suggested Lab Sessions
DC Motor Drive	Parameters Identification
	Current Control
	Speed Control
PMSM Motor Drive	Transformations: Clark, Concordia, and Park
	Self-Control: Hysteresis and PI Control
	Vector Control
Induction Motor Drive	V/f Control
	Vector Control
Doubly-Fed Induction Motor Drive	Rotor Controller
	Vector Control

## Features

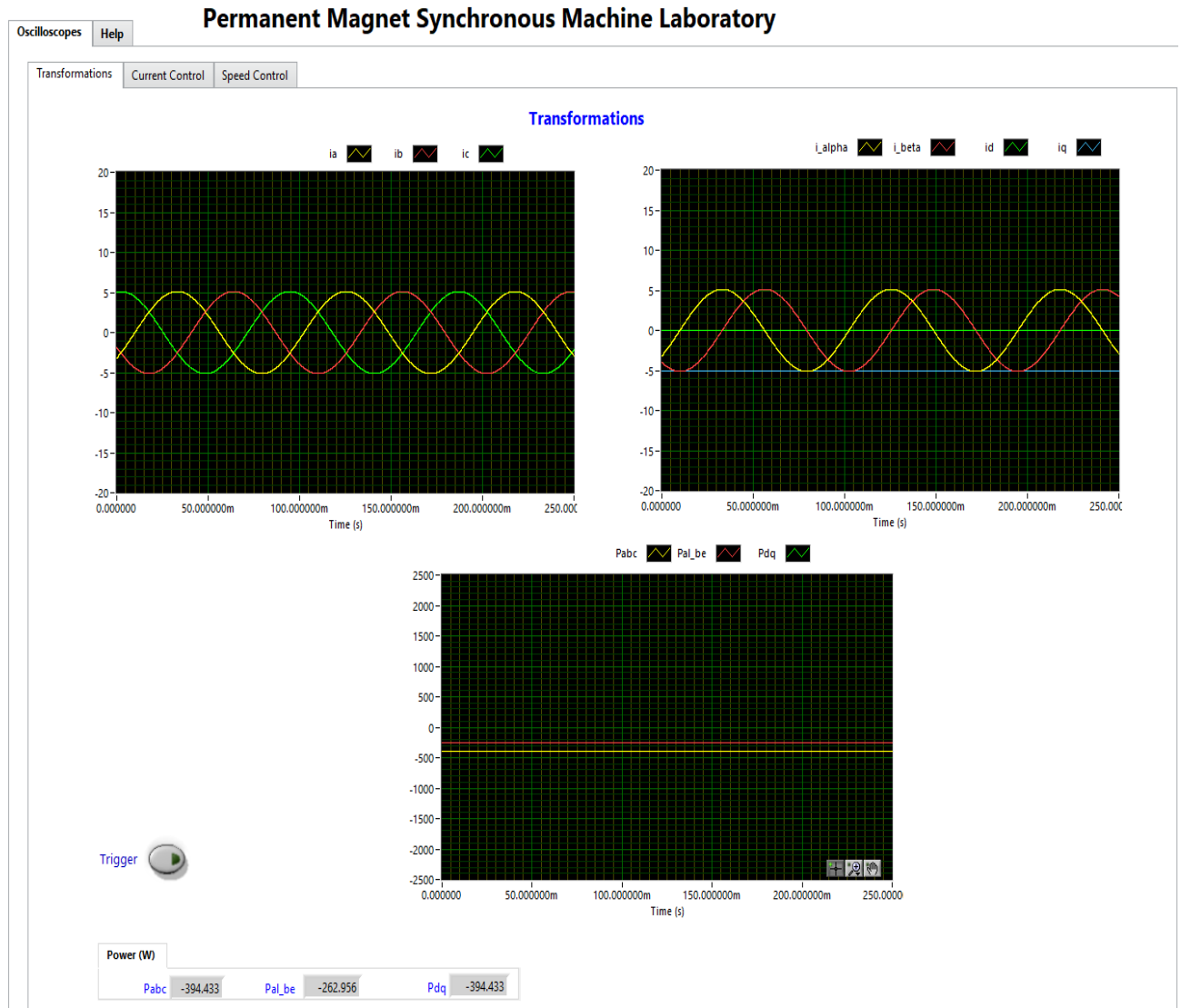
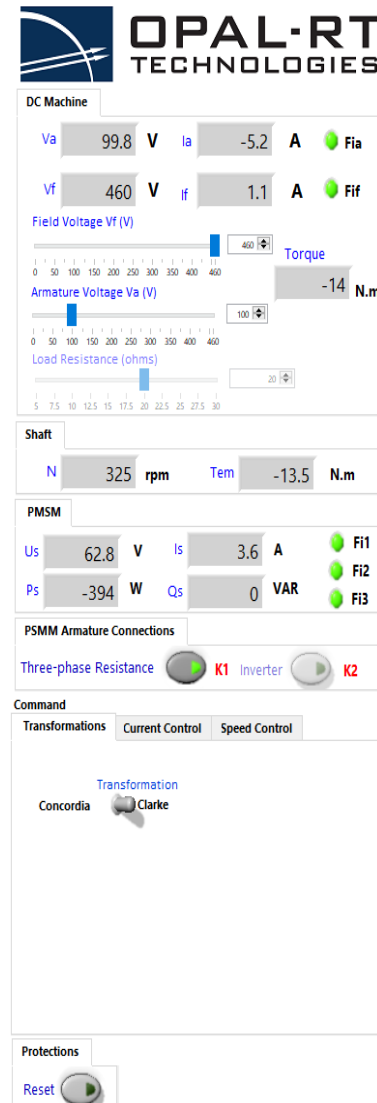
- Scope:  
Trigger, Cursor, Zoom-In,  
Zoom-out
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Parameters Identification
- Current Control
- Speed Control
- Varying resistive load
- Varying input voltage
- Varying current and speed  
references
- Computation of RMS  
Voltage and Current





## Features

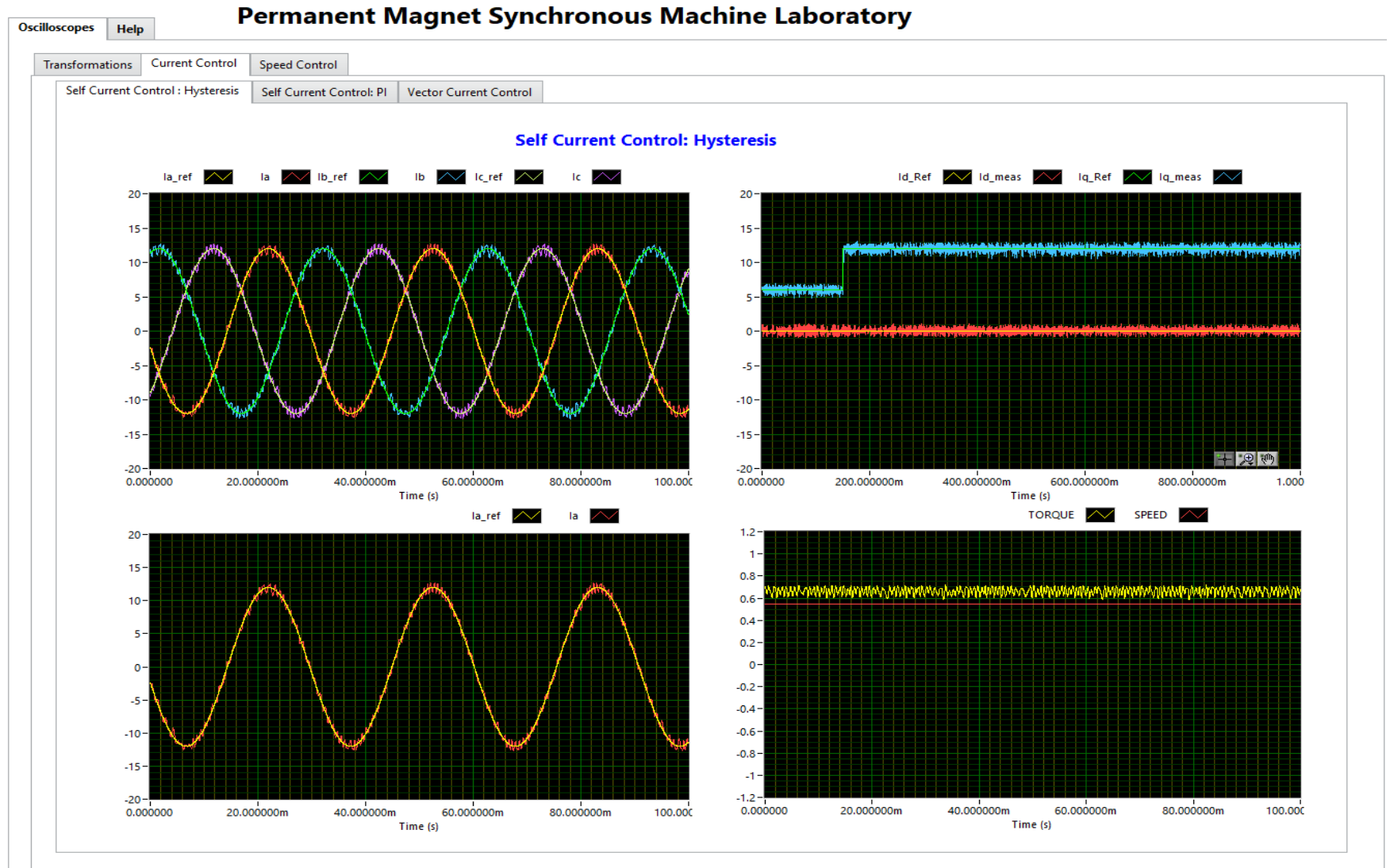
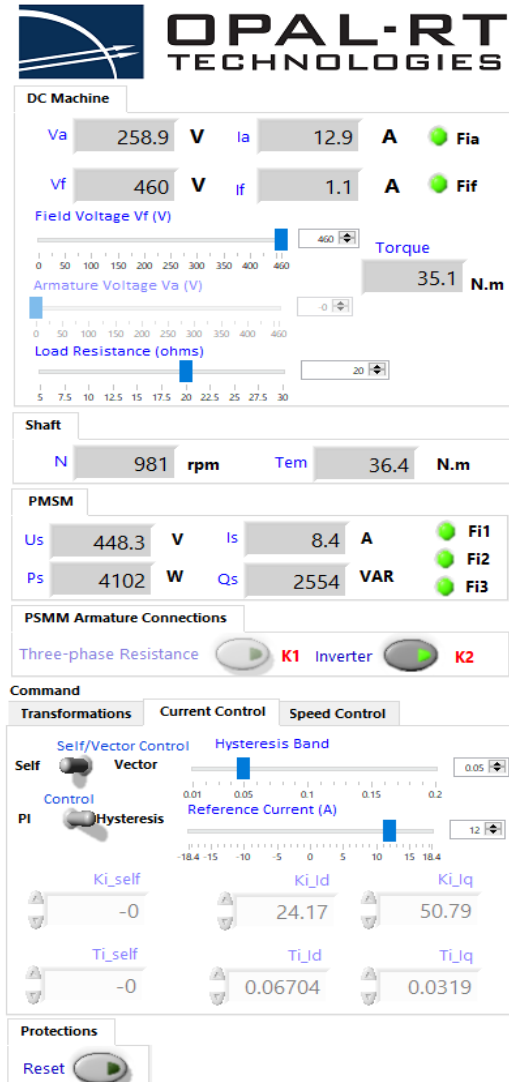
- Scope:  
Trigger, Cursor, Zoom-In,  
Zoom-out
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Parameters Identification
- Self current control
- Vector current control
- Speed control
- Varying resistive load
- Clarke, Concordia and Park transformations
- Varying armature voltage
- Varying current and speed references
- Computation of RMS voltage and current
- Power computation



# MOTOR DRIVES

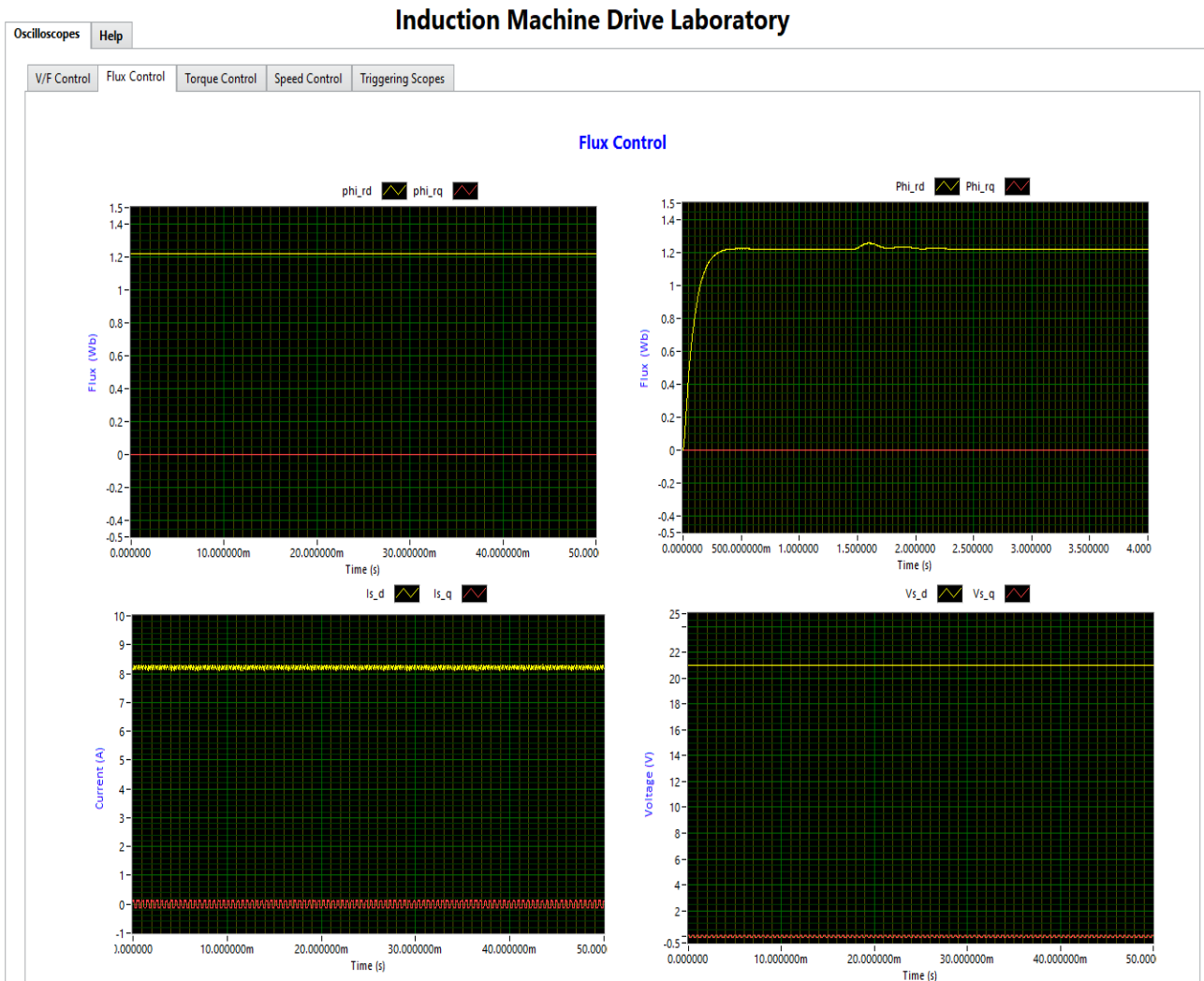
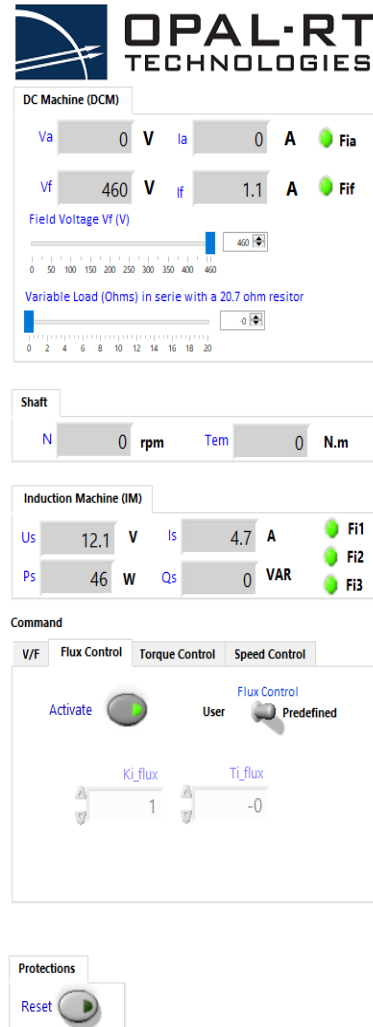
Power Electronics  
Electric Machines  
Renewable Energy  
Fundamentals Elec. Eng.  
**Motor Drives**

DC Motor Drive  
**PMSM Motor Drive**  
Induction Motor Drive  
Doubly-Fed ind. Motor Drive



## Features

- Scope:  
Trigger, Cursor, Zoom-In,  
Zoom-out
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- V/f control
- Flux control
- Torque control
- Speed control
- Varying resistive load
- Varying torque and speed  
references
- Computation of RMS  
voltage and current
- Power computation
- User and predefined  
controls



# MOTOR DRIVES

Power Electronics  
Electric Machines  
Renewable Energy  
Fundamentals Elec. Eng.  
**Motor Drives**

DC Motor Drive  
PMSM Motor Drive  
**Induction Motor Drive**  
Doubly-Fed ind. Motor Drive



**DC Machine (DCM)**

Va 122.7 V Ia -5.9 A Fia

Vf 460 V If 1.1 A Fif

Field Voltage Vf (V)

Variable Load (Ohms) in series with a 20.7 ohm resistor

**Shaft**

N 499 rpm Tem 15.4 N.m

**Induction Machine (IM)**

Us 146.2 V Is 5.9 A Fi1

Ps 901 W Qs 1085 VAR Fi2

Fi3

**Command**

V/F Flux Control Torque Control **Speed Control**

Enable User Speed Control

Reference Speed (rpm)

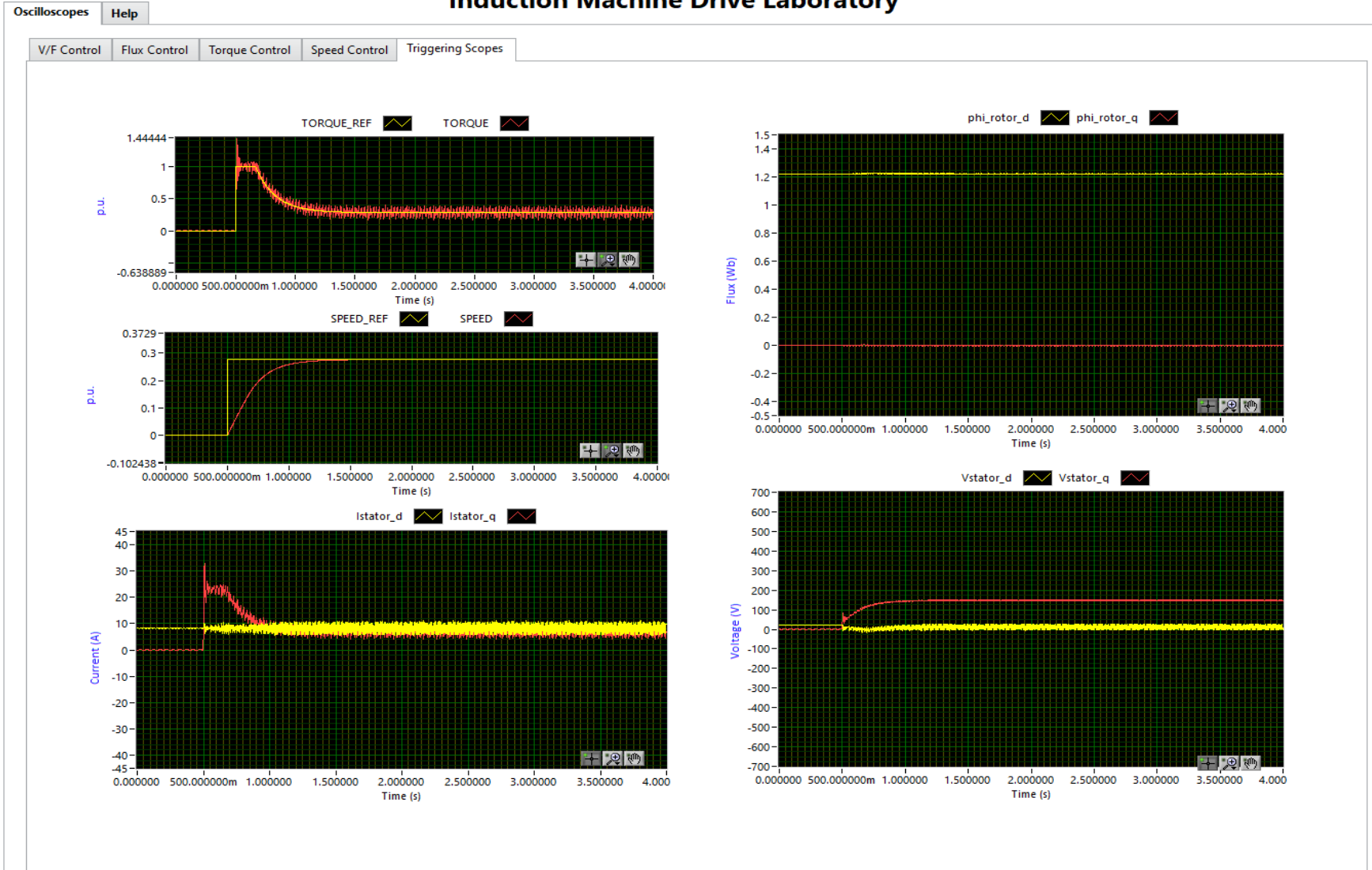
Ki\_speed Ti\_speed

0.01 -0

**Protections**

Reset

## Induction Machine Drive Laboratory



## Features

- Scope:  
Trigger, Cursor, Zoom-In, Zoom-out
- Nameplate & Ratings
- Protection:  
Fuse & Reset
- Rotor controller
- Current control
- Speed control
- Varying input torque
- Varying current and speed references
- Computation of RMS voltage and current

