

# MINICURSO: PSCAD

Cleiton Magalhães Freitas



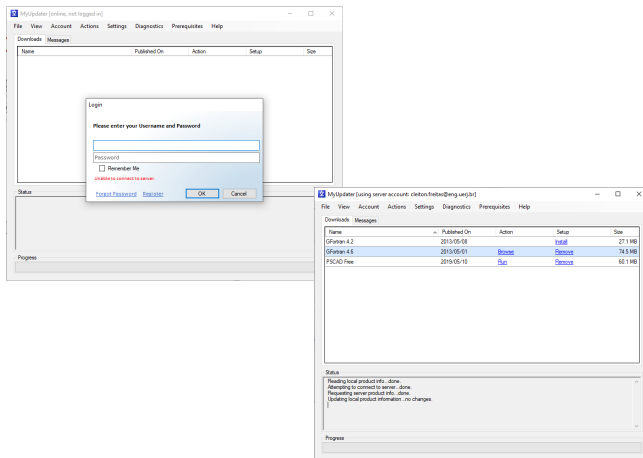
- 1 Visão Geral do PSCAD
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# Visão Geral do PSCAD

# Primeiros Passos no PSCAD

# PSCAD: Versão Gratuita

apenas um teste



# PSCAD: Versão Gratuita

The screenshot displays the PSCAD Free software interface. The top menu bar includes Home, Project, View, Tools, Utilities, and a Return Certificate (Free Edition) button. The toolbar contains various icons for file operations (Cut, Copy, Paste, Delete), simulation (Clean, Build, Build Modified, Run, Stop, Pause, Skip, Step, Snapshot, Slow), and editing (Plot Step, Save Scenario, Delete Scenario, View Scenario, Active Scenario, Back, Forward, Up, Undo, Redo, Select, Wire Mode, Zoom In, Zoom Out, Zoom Extent, Zoom Rectangle). The main workspace is titled 'master:Main() Start Page' and features a 'Go To MyCentre' button. The 'Start Page' is divided into three columns: 'Updates', 'News', and 'Videos'. The 'Updates' column contains two entries: 'PSCAD v4.6.3 Update 5' (dated 10/21/2020) and 'PSCAD v4.6.3 Update 4' (dated 08/05/2020). The 'News' column contains two entries: 'New PSCAD Webinar Series' (dated 05/27/2020) and 'COVID-19 Update' (dated 03/25/2020). The 'Videos' column contains two entries: 'Blackbox features - PSCAD Version 5' and 'PSCAD™ V5 - New Feature Blackbox'. The bottom status bar shows 'Build Messages', 'Runtime Messages', 'Component Wizard', and a search bar.

## Welcome to PSCAD!

### Updates

#### PSCAD v4.6.3 Update 5

10/21/2020 07:12:03 PM

PSCAD v4.6.3 Update 5 is now available for eligible users. Recent updates provided by some anti-virus programs had triggered the blocking of PSCAD compile time and runtime batch files, as they contained multiple period '.' characters. These filenames have been changed to include only a single period, thereby resolving the blocking issue. We have also included some improved licensing error logging.

For more details about this update, please contact [sales@pscadd.com](mailto:sales@pscadd.com).

#### PSCAD v4.6.3 Update 4

08/05/2020 02:15:51 PM

We are pleased to announce the release of PSCAD v4.6.3 Update 4 which supports TLS 1.2, includes an updated Master Library 4.6.3.2, and supports improved lock-based and certificate licensing.

All Professional v4.6.3 and Educational Edition licenses are eligible for this update. Those with active maintenance can obtain the download via MyCentre. If it is not automatically available in your MyCentre account, please contact your workgroup administrator, or [sales@pscadd.com](mailto:sales@pscadd.com).

For more details about this update, please click [here](#).

### News

#### New PSCAD Webinar Series

05/27/2020 06:29:42 PM

We are happy to announce we are hosting another Webinar Series!

For topics, dates and details visit our website [here](#).

We hope you can join us!

#### COVID-19 Update

03/25/2020 03:06:58 PM

The health and safety of our employees and customers remains our top priority. Until further notice, PSCAD will operate as a virtual company and all employees will be working from home or a safe remote location. We are focused on remaining available for our clients, and will continue to operate with the same timeliness that our customers and colleagues expect from us. Please stay safe and healthy.

### Videos

#### Blackbox features - PSCAD Version 5

08/26/2020 04:09:31 PM

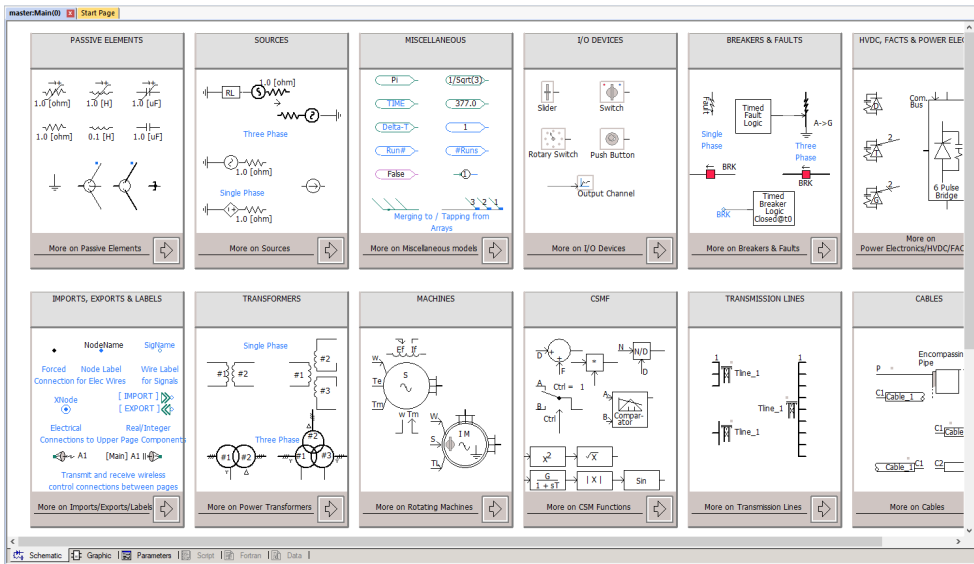
#### PSCAD™ V5 - New Feature Blackbox

### Recent Videos

#### Blackbox features - PSCAD Version 5

08/26/2020 04:09:31 PM

# PSCAD: Biblioteca Master



# PSCAD: Biblioteca Master

master:Main(0):Passive(0) Start Page

**RLC Branch Components**  
Series or Parallel Combinations or RLC are Automatically Collapsed.

**Series RLC Tuned Filter**

**High Pass RLC Filter**

**Band Pass RLC Filter**  
 $F = 300.0$  [Hz]

**C-Type Filter**

**Runtime Configurable Passive Branch**

**Frequency Dependent Network Equivalent**  
FDNE1  
1  
2  
3  
Frequency Dependent Network Equivalent

**Variable RLC Components**  
(Allows entry of numbers (like 1.0) or Variable Names (ABC)...)
 

- 1.0 [ohm]
- 1.0 [H]
- 1.0 [uF]

**Single/Three Phase L-G Fixed Load**  
P+Q

**Single Phase L-L Fixed Load**

**3 phase loads**  
(Resistive, Inductive and Capacitive)
 

- 1.0 [MW]
- 1.0 [MVAR]
- 1.0 [MVAR]

**Transposition wires**

**Wires**

**Bus**

**3 phase short**

**Spark Gap**

**PASSIVE ELEMENTS**

- 1.0 [ohm]
- 1.0 [H]
- 1.0 [uF]
- 1.0 [ohm]
- 0.1 [H]
- 1.0 [uF]

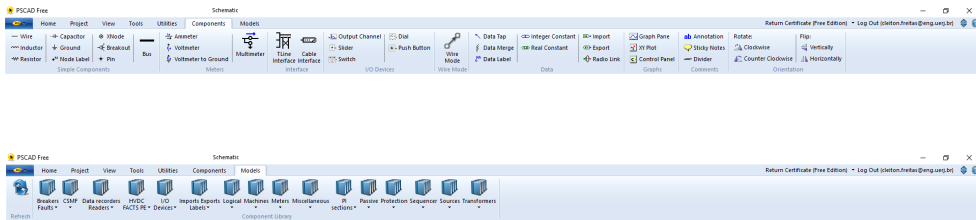
More on Passive Elements

Schematic | Graphic | Parameters | Script | Fortran | Data



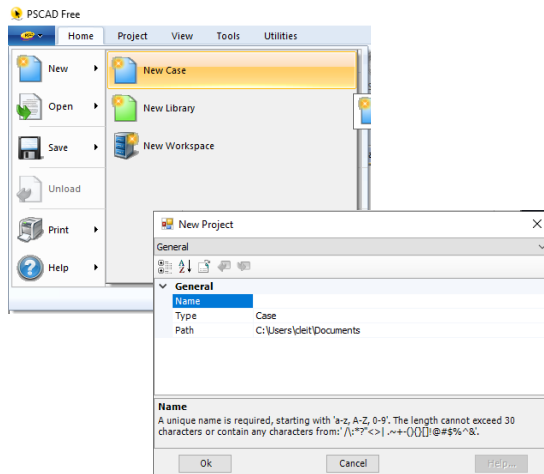
# PSCAD: Biblioteca Master

Quando um projeto está aberto, também podemos acessar os componentes através dos seguintes menus.



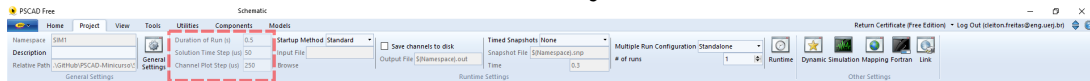
# Criando uma Simulação: *New Case*

- *New Case*: Cria uma nova simulação
- *Name*: Nome do arquivo de simulação
- *Path*: Lugar onde salvar a simulação



# Criando uma Simulação: Parâmetros do Projeto

## Menu *Project*



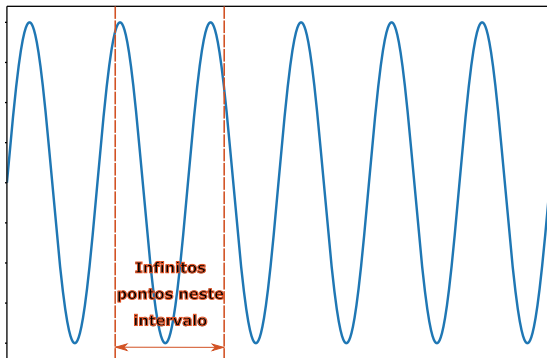
- *Duration of Run*: Tempo total de simulação
- *Time Step*: Intervalo de tempo entre os cálculos
- *Plot Step*: Intervalo de amostragem usado nos gráficos

# Importância do Time Step

## Mundo Real:

- O mundo é contínuo
- Existe um número **INFINITO** de instantes em um intervalo de tempo

$$y(t) = \sin(120\pi t)$$

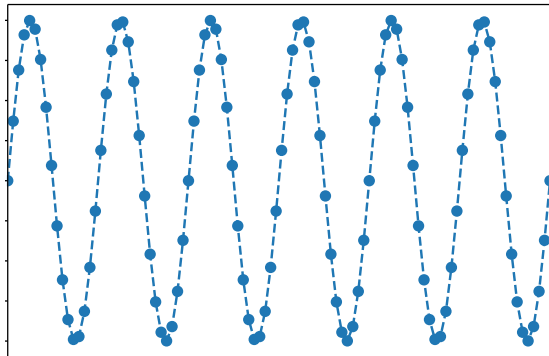


# Importância do Time Step

## Simulação Digital:

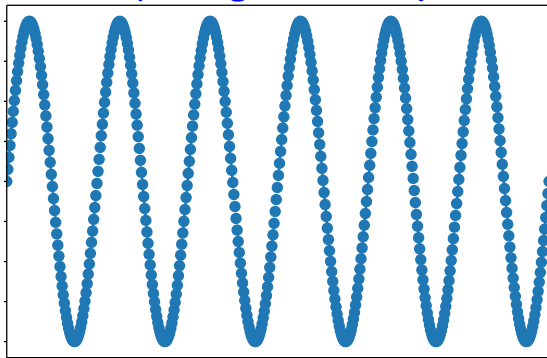
- O mundo é discreto
- Existe um número **FINITO** de instantes em um intervalo de tempo

$$y[kT_s] = \sin(120\pi kT_s)$$

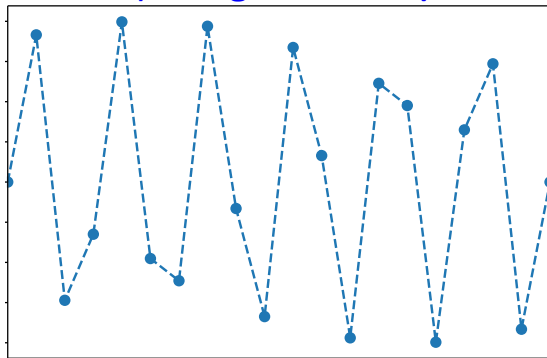


# Importância do Time Step: ainda a senoide

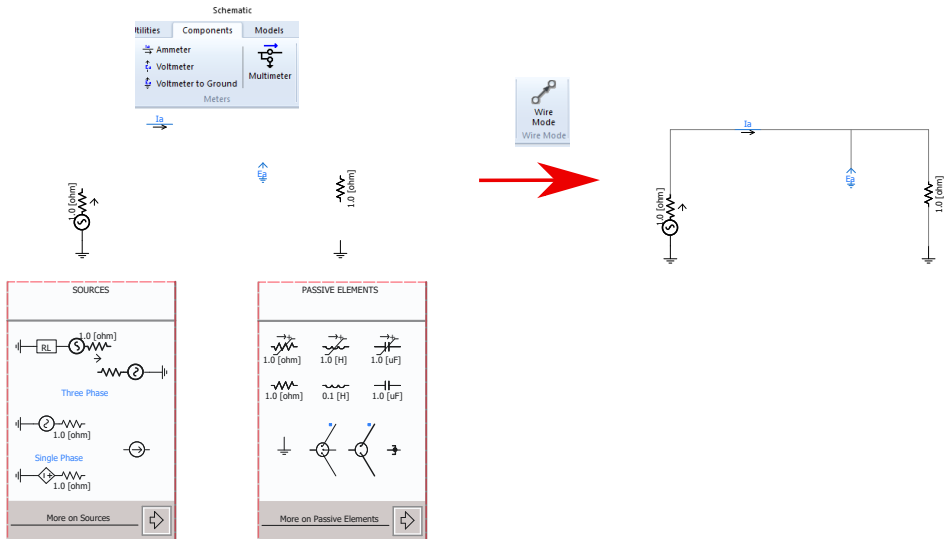
**Simulação Digital: Muito preciso**



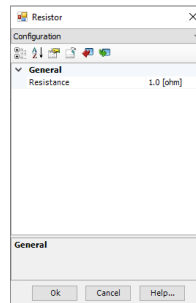
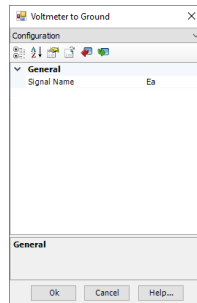
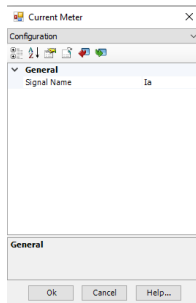
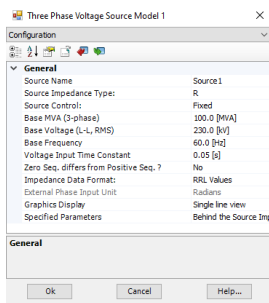
**Simulação Digital: Pouco preciso**



## Criando uma Simulação: Continuando

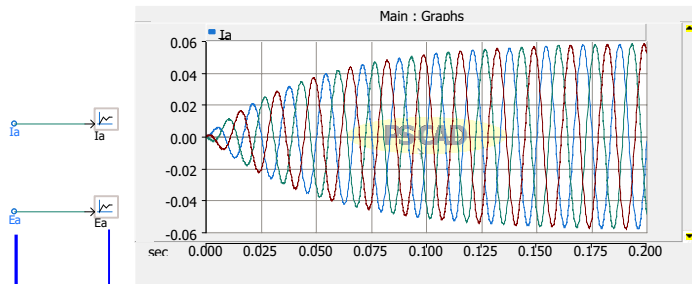


# Criando uma Simulação: Configuração dos componentes





# Criando uma Simulação: Gráficos



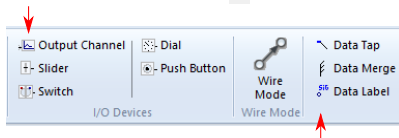
Output Channel

Data Label

Grafico:  
- Botão direito no  
output channel

-Graph/meters/controls

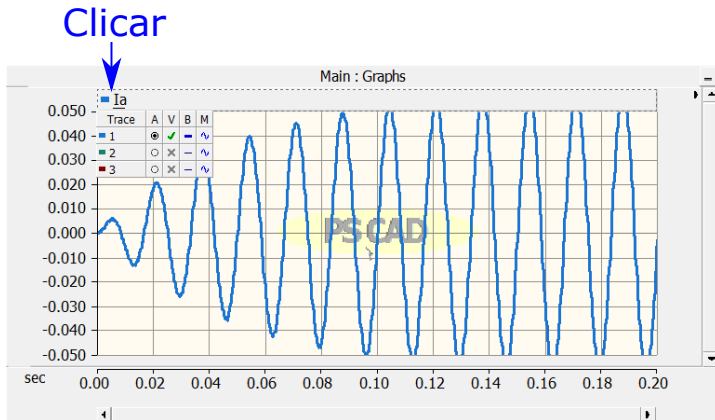
- add overlay graph  
with signal



## Visualização de Resultados: Alguns Detalhes

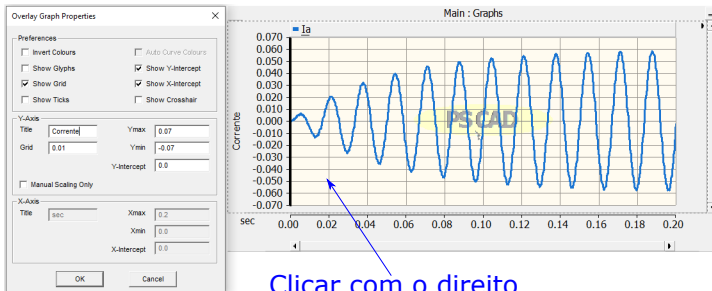
# Ajustes nos Gráficos: Curvas

- É possível selecionar qual curva mostrar
- É possível selecionar aumentar a espessura da curva



# Ajustes nos Gráficos: Escala

- Propriedades do gráfico
- Permite ajustar a escala
- Permite alterar a grade



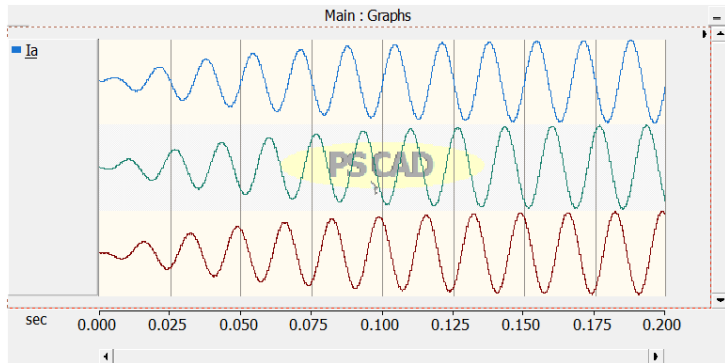
# Ajustes nos Gráficos: Atalhos

Depois de clicar no gráfico:

- **E** - Ajusta a escala do tempo
- **Y** - Ajusta a escala y do gráfico para melhor visualização
- **B** - Ajusta a escala y do gráfico de acordo com a configuração do output channel
- **M** - Habilita dois cursores

# Ajustes nos Gráficos: Polygrphs

- Propriedades do gráfico
- Permite ajustar a escala
- Permite alterar a grade



# Ajustes nos Gráficos: adicionando curvas ao gráfico

# Ajustes nos Gráficos: Painéis de Controle



# Ajustes nos Gráficos: Medidor Fasorial

## Exportando Dados

# Criação de Componentes e Bibliotecas

## Criação de Componentes: Usando Scripts

# Automação de Simulações

## Aplicação - Retificadores

## Aplicação: Inversores

## Aplicação: Sistemas de Controle



## Aplicação - Máquinas Elétricas

## Aplicação - Faltas

## Conclusões

# Obrigado pela Atenção!

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