

MINICURSO: PSCAD

Cleiton Magalhães Freitas



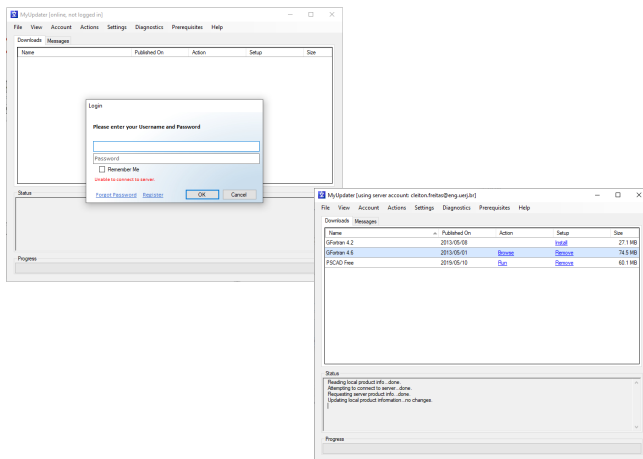
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Visão Geral do PSCAD

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, and Utilities. Below it is a toolbar with 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 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 three entries: 'New PSCAD Webinar Series' (dated 05/27/2020), 'COVID-19 Update' (dated 03/25/2020), and 'Support for the older Intel Fortran compilers and GFortran compilers - PSCAD v5.0' (dated 02/19/2020). The 'Videos' column contains two entries: 'Blackbox features - PSCAD Version 5' and 'PSCAD™ V5 - New Feature Blackbox'. A 'Recent Videos' section is also visible at the bottom right. On the left side, there is a 'Workspace' panel showing a tree view of the project structure, including 'master (Master Library)' and 'Simulation Sets'. At the bottom left, there is a 'Build Messages' panel showing a table of build messages with columns for Type, Id, Component, and Namespace.

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.

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.

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

New Transformer Models for PSCAD
02/11/2020 09:07:43 PM

Various transformer and auto-transformer

News

New PSCAD Webinar Series
05/27/2020 08:29:42 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.

Support for the older Intel Fortran compilers and GFortran compilers - PSCAD v5.0
02/19/2020 09:02:40 PM

Support for the Intel Fortran compilers earlier than 12.0, and GFortran 4.2.1 has been removed as of PSCAD v5.0. If you will be using PSCAD v5.0, compiling may be performed using either the free Fortran compilers that come bundled with PSCAD (GFortran v4.6 and GFortran v8.1), or by using the professional edition of Intel Fortran compiler (versions 12 through 19).

If your project calls any libraries or objects, these must be pre-compiled using the same compiler as your project.

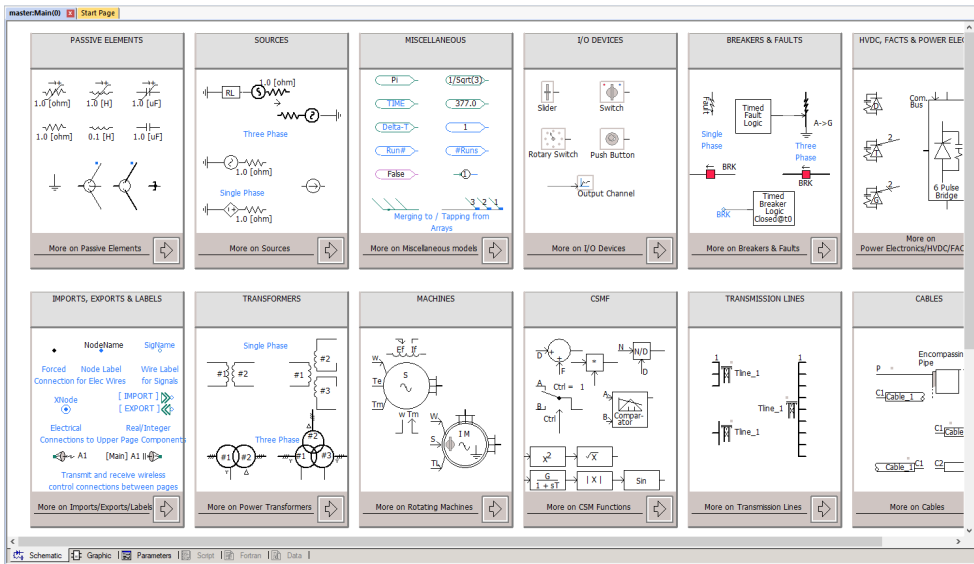
Videos

Blackbox features - PSCAD Version 5
08/26/2020 04:09:31 PM

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

The screenshot displays the PSCAD Master Library window, which is organized into several sections of passive components:

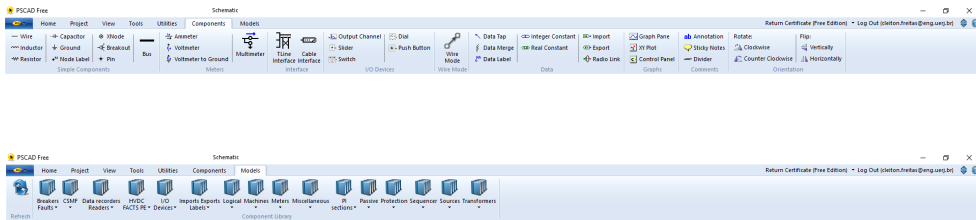
- RLC Branch Components:** This section includes symbols for a resistor (1.0 [ohm]), an inductor (0.1 [H]), and a capacitor (1.0 [uF]). Below the symbols, it states: "Series or Parallel Combinations or RLC are Automatically Collapsed."
- Series RLC Tuned Filter:** A symbol for a series combination of a resistor (1.0 [ohm]), an inductor (0.1 [H]), and a capacitor (5.0 [uF]).
- High Pass RLC Filter:** A symbol for a high-pass filter consisting of a resistor (1.0 [ohm]) in series with a parallel combination of an inductor (0.1 [H]) and a capacitor (5.0 [uF]).
- Band Pass RLC Filter:** A symbol for a band-pass filter with a frequency $F = 300.0$ [Hz].
- C-Type Filter:** A symbol for a C-type filter, which is a series combination of a capacitor and a resistor.
- Runtime Configurable Passive Branch:** A symbol for a runtime configurable passive branch.
- Frequency Dependent Network Equivalent:** A symbol for a frequency-dependent network equivalent, labeled FDNE1, with three terminals (1, 2, 3) and a ground connection.
- Variable RLC Components:** This section includes symbols for a variable resistor (1.0 [ohm]), a variable inductor (1.0 [H]), a variable capacitor (1.0 [uF]), and a variable capacitor with a ground connection. Below the symbols, it states: "Allows entry of numbers (like 1.0) or Variable Names (ABC)..."
- Single/Three Phase L-G Fixed Load:** A symbol for a single/three phase L-G fixed load, labeled P+Q.
- Single Phase L-L Fixed Load:** A symbol for a single phase L-L fixed load.
- 3 phase loads (Resistive, Inductive and Capacitive):** This section includes symbols for a 3-phase resistive load (1.0 [MW]), a 3-phase inductive load (1.0 [MVAR]), and a 3-phase capacitive load (1.0 [MVAR]).
- Transposition wires:** A symbol for transposition wires, showing two crossing lines.
- Wires:** A symbol for a wire, represented by a horizontal line.
- Bus:** A symbol for a bus, represented by a horizontal line with a vertical line connecting to it.
- 3 phase short:** A symbol for a 3-phase short circuit, represented by a circle with three arrows pointing towards it.
- Snark Gun:** A symbol for a snark gun, represented by a circle with a cross inside.

A red dashed box highlights the **PASSIVE ELEMENTS** section, which contains a grid of symbols for various passive components, including resistors, inductors, capacitors, and a ground connection. Below the grid, there is a button labeled "More on Passive Elements" with a red arrow pointing to the right.

At the bottom of the window, there is a toolbar with icons for Schematic, Graphic, Parameters, Script, Fortran, and Data.

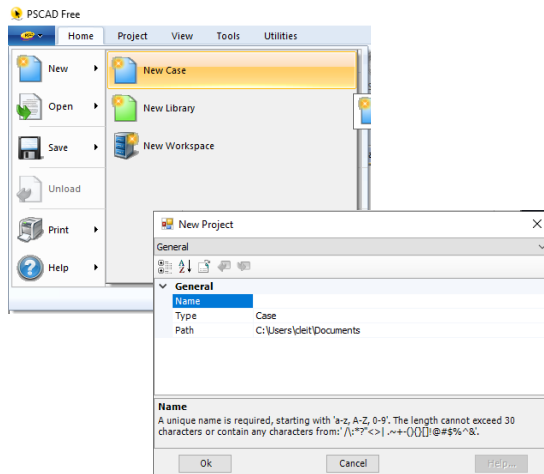
PSCAD: Biblioteca Master

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



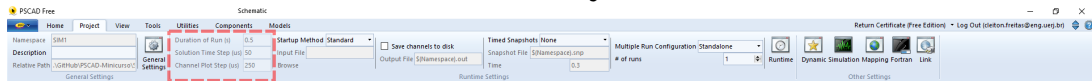
Criando uma Simulação: *New Case*

- *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*



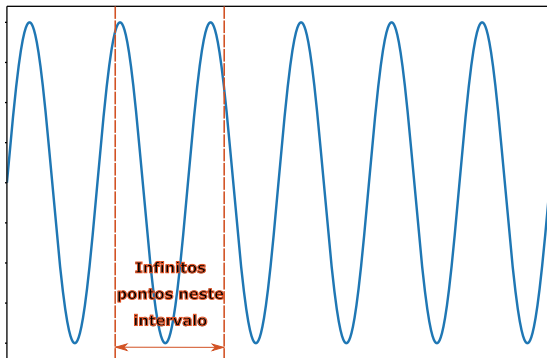
- *Duration of Run*: Tempo total de simulação
- *Time Step*: Intervalo de tempo entre os cálculos
- *Plot Step*: Intervalo de amostragem usado nos gráficos

Importância do Time Step

Mundo Real:

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

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

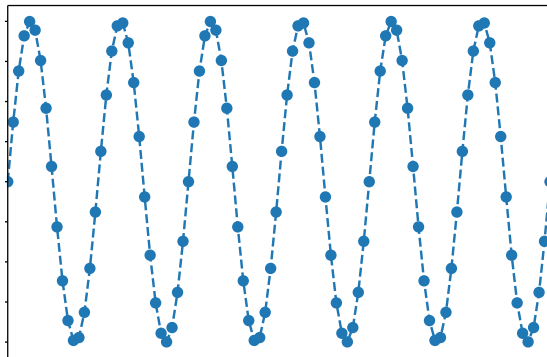


Importância do Time Step

Simulação Digital:

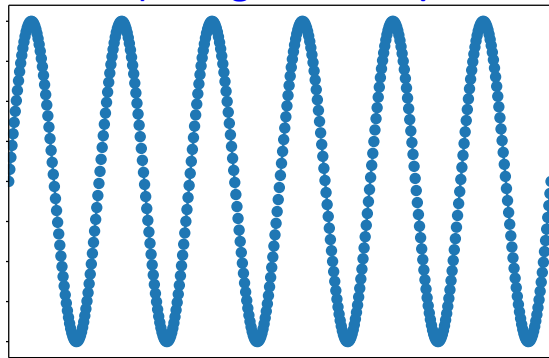
- O mundo é discreto
- Existe um número **FINITO** de instantes em um intervalo de tempo

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

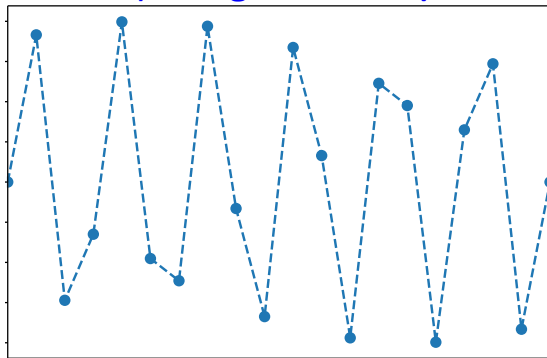


Importância do Time Step: ainda a senoide

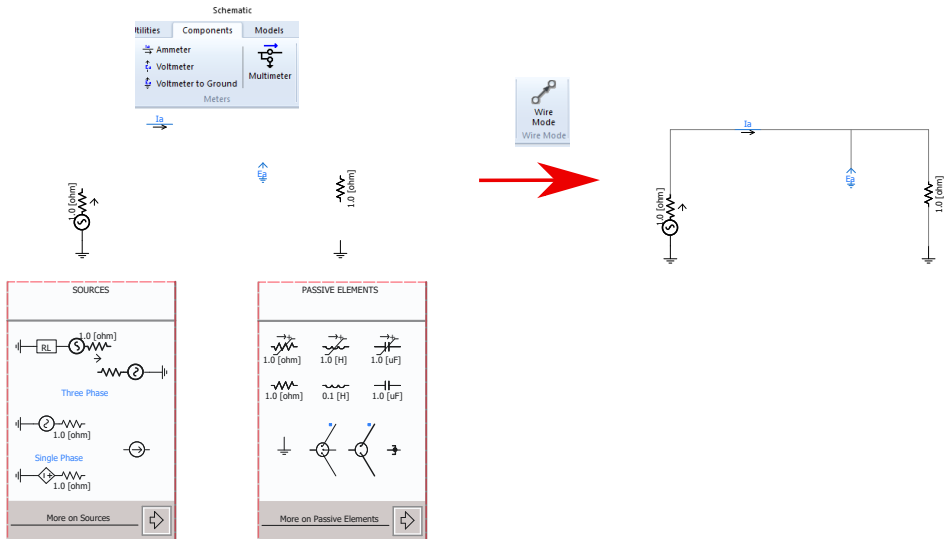
Simulação Digital: Muito preciso



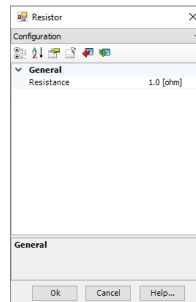
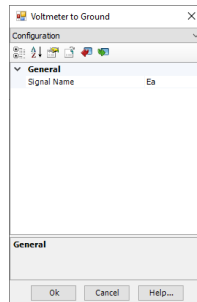
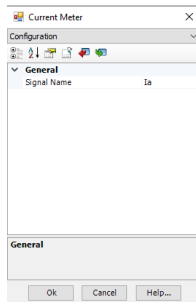
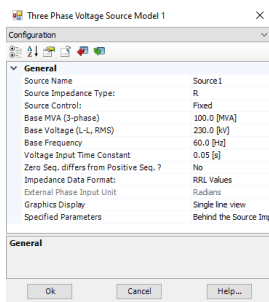
Simulação Digital: Pouco preciso



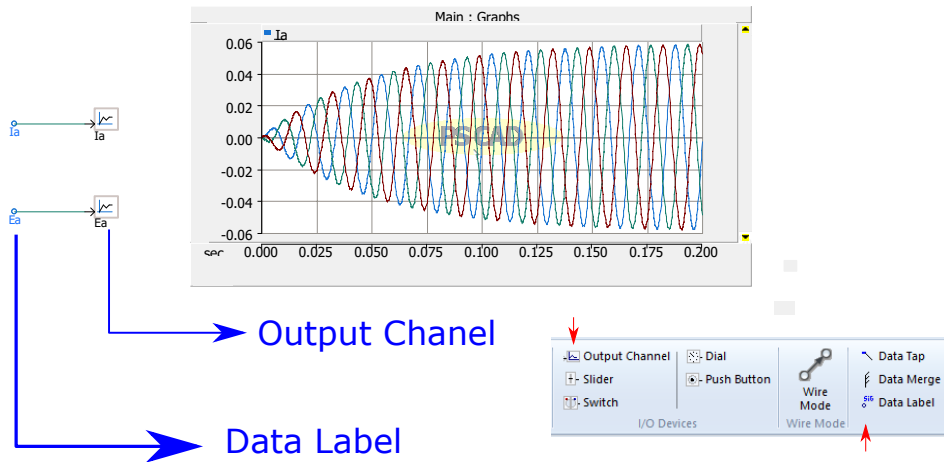
Criando uma Simulação: Continuando



Criando uma Simulação: Configuração dos componentes



Criando uma Simulação: Gráficos



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!

Cleiton Magalhães Freitas

✉ cleiton.freitas@uerj.br

