

Software **SwitchgearDesign_307**

The software was created by Sergio Feitoza Costa to help to develop equipment for substations (medium and low voltage) mainly PANELS, CUBICLES, BUSWAYS, BUS DUCTS, SWITCHES, ISOLATORS, DISCONNECTORS, CCM's AND PARTS OF COMPLETE SUBSTATIONS. It is a unique tool designed for non-commercial purposes. It is focused in the products of the standards IEC 62271-200, IEC 61439 series, IEC TR 61641. A module to calculate the magnetic and electric field levels in or near power substations is under validation and will be available soon. A module for the simulation of breaking tests in circuit breakers and fuses is also coming.

It is a tool of free use under the condition of non-commercialization, no distribution of copies to third parties, and no compromises from the author or Cognitor with maintenance or technical support. To use it properly the user need to have some experience of electrical design and have participated in the 3 or 4 days training. The "In Company" training is available in English, Spanish and Portuguese

The goal is to allow manufacturers and other users, with limited access to testing laboratories, to perform virtual testing to develop their products before going to a testing laboratory for getting an expensive type test report which can be used for commercialization. *The software is not sold alone because to use a tool without knowing technical design concepts is useless. We provide a training course and the participants receive a complete copy of the software and learn how to use it.*

SwitchgearDesign_307 is not an academic tool but, instead, is directed to solve problems of the real world without the need of expensive and – hard to learn and to use – modeling tools.

The author has an international recognized experience with high power and high voltage testing, equipment and testing laboratories design, construction, operation and management. He is for a long time member of IEC and Cigre working groups. Some time ago he was the chairman of IEC Technical Committee 32. The CV is at http://www.cognitor.com.br/en_curriculum.htm

SwitchgearDesign 307 allows simulating the following tests and measurements:

- Short time and crest withstand current (electrodynamical stress, mechanical stress).
- Temperature rise tests.
- Internal arc test (calculation of overpressure, burnthrough and supportability)

The participants of the training course learn how to use the software and, a more valuable thing, to better understand the design concepts and technical standards.

TRAINING COURSE PROGRAM: <http://www.cognitor.com.br/SoftwareEN.htm>

DEMO OF THE SOFTWARE: instructions to download and to install below.

FREE DOWNLOAD OF THE BOOK: http://www.cognitor.com.br/Book_SE_SW_2013_ENG.pdf

The teaching material in this book includes the following chapters or modules

1. Studies Which Are The Base of the Technical Specifications

2. Overvoltages and Insulation Coordination
3. Short Circuits, Ampacities, Overloads and Electrical Contacts.
 - Temperature Rise
 - Forces and Electrodynamical Forces during Short Circuit.
 - Transient Recovery Voltages and Interruption Processes
4. Power Arcs and Safety of Persons and Installations
5. Technical Specifications Issued By Power Utilities
6. Medium Voltage and Low Voltage Switchgear Standards (IEC_62271-200 and IEC 61439)
7. Simulation Of High Power Tests and Use Of The Software SwitchgearDesign_307

SOFTWARE VERSIONS: It is available in two versions (Table 1). The first one is the “VERSION DISTRIBUTED IN THE COURSE” received by the participants of the training. With the direct explanation by the software developer everything becomes easier. The second one is the “FREE DEMO VERSION”.

Table 1 – Versions of the software SwitchgearDesign_307

Features	“ Demo”	“Distributed in the Course”
Simulation of temperature rise test	Yes	Yes
Simulation of electrodynamical forces	Yes	Yes
Simulation of internal arc test	Yes	Yes
3D geometry visualization	Yes	Yes
Mapping of magnetic field	No	Yes
Module MVSW1 (medium voltage)	Yes	Yes
Modules LVSW1 e LVSW2 (low voltage)	Yes	Yes
Module DUCT_1 (busways)	Yes	Yes
Module SWITCH (under validation)	Yes	Yes
Module FUSE_1 (expulsion type fuses)	No	No
Database and possibilities to modify, save and create new cases.	Few cases which cannot be modified or saved as.	Comes with cases for each module. User can create as many more as you wish.
Training course “ IN COMPANY”	No	Yes
Customized software	Under request	Under request

TERMS OF USE AND SOFTWARE VALIDATION

Due to the complexity of the calculations and the number of variables involved, it is necessary that the user has attended the training to be able to interpret the specific results and how these results relate to the technical standards. This training is available “In your Company “in English or Spanish or Portuguese.

Regarding to the RESPONSIBILITY FOR THE RESULTS , the program can be used, “as it is” at the user 's own risk and neither the author nor Cognitor are responsible for any use which may be given to the results.

As for VALIDATION OF RESULTS , some of the cases that come with the software correspond to tests actually performed in testing laboratories. These “validated cases ” are shown in several articles published by the author of the software that can be freely downloaded on the website http://www.cognitor.com.br/en_download.htm

The difficulties of obtaining more information to validate the results are primarily due to certain deficiencies or

omissions in the current editions of technical standards relating to information that should be included in the reports issued by testing laboratories, but are not included because the standard does not request them (read the articles).

DOWNLOAD THE INSTALLER OF THE SOFTWARE DEMO

You need only to click in the link http://www.cognitor.com.br/SetUp_SwitchgearDesignDemoEN.zip

and to follow the installation instructions

This demo is intended to work well on all operating systems. Although it has been already installed on many-many different computers of the participants of the courses sometimes when installed in another PC may be necessary to add some extra files in the installer to avoid an error during the installation or use.

So, if an error occurs during the installation please save the error message and send it to the email sergiofeitoza@cognitor.com.br A typical error message is ... "The fileis missing."

After the successful installation you may start using the demo by checking and unchecking the box GEOMETRY at the top and then clicking RESULTS DATA or INPUT or 3D. The instructions to move through the screens of the software are in Section 7 of the book of course. Depending where the course is applied, the didactic material and the screens of the software are written in English or Spanish or Portuguese.

INSTALLATION INSTRUCTIONS FOR THE SOFTWARE DEMO

- a) Create a directory on your computer and save the downloaded file there. Unzip the file and click in the file with the right side button of the mouse. Click with the left side on "Run as Administrator" to start the installation.
- b) Click OK for everything and when a password, is requested type **kalimera**
- b) After the installation an icon SwitchgearDesignDemo will be created in the desktop and in the list of the START button.
- d) Only a single directory will be created in your computer. It is named c://SergioFeitoza . All the needed files will be there. Nothing more will be installed outside this directory

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The didactic material is also in the link below where it is possible to read free in the left side of the page

<http://www.bookess.com/read/15214-reference-text-for-the-courses-switchgear-busways-isolators-substations-equipment/>

Access to the forum "Switchgear (Mv & Lv): A Proposal For An IEC Guide For Testing Simulations.

http://www.linkedin.com/groups/Switchgear-MV-LV-proposal-IEC-4219744?trk=myg_ugrp_ovr

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