POWERFACTORY

DIgSILENT Simulation Language (DSL)

S2021.03.15.Online_DSL.En

March 15th - March 16th 2021

Online training course

The two-day training “DIgSILENT Simulation Language (DSL)” gives an overview of the modelling process in *PowerFactory* using the simulation language DSL. The whole procedure of translating a physical system into a set of mathematical equations and implementing it using DSL will be introduced and practised by the participant.

The course introduces various aspects of the DSL language, including the description of differential equations, issuing simulation events and coding dead-times, giving the participant the opportunity to practice with a wide range of different type of proposed exercises different aspects of DSL modelling. A procedure and guide to establish initial conditions will be exposed and practised.

WHO SHOULD ATTEND:

The course is intended for

- Utility engineers
- Power system operators
- Project Developers
- Manufacturers
- Consultants and electrical engineers

interested in the modelling of control processes within the power systems.

Participants should be familiar with *PowerFactory* basics and should have experience with *PowerFactory*’s time domain simulation functions.

PRICE PER PARTICIPANT:

- 1,116.00€* (with valid maintenance contract)
- 1,270.00€* (without valid maintenance contract)
- 380.00€* (with valid student identification)

*Prices are exclusive of VAT

Training schedule

Central European Time (UTC +01:00)

DAY 1

9:00 Dynamic Modelling Approach in *PowerFactory*
Fundamentals. Dynamic modelling in practice.

9:30 Exercise: Dynamic Modelling Approach
Identify and familiarise with dynamic controls and connection patterns associated to grid elements.

10:00 Dynamic Modelling Handling
Model type/elements handling. Identification of Common model and Composite model.

10:15 Exercise: Include Dynamic Models in a Network
Definition of dynamic models from standard model definitions and composite models.

10:30 Coffee break

11:00 Dynamic Modelling Concepts
Interpret and visualise a functional block diagram. Identify the transfer function in a block diagram.

11:30 Exercise: Interpret a Block Diagram

11:45 Introduction to DSL and Graphical Modelling
Implementation of models via graphical interface. General considerations of DSL.

12:30 Lunch break

13:30 Exercise: Model Definition of a Voltage Controller
Usage of the standard macros to build a block diagram to represent an excitation system. Definition of a frame diagram.

14:00 Dynamic Model Initialisation
Initialisation concept and procedure. Dynamic model definition: common and composite model.

14:30 Exercise: Initialisation of the Voltage Controller Model
Definition of the initial conditions for the excitation system.

15:00 Coffee break

15:30 Composite Frame Implementation
Definition of composite frame. Identification of signal names in a composite frame.

15:45 Exercise: Implementation of the Voltage Controller Model and Test
Define the composite model and test the voltage controller.

16:15 Dynamic Model Templates
Packing and re-using models. Template definition.

16:30 Exercise: Define and use a Generator Set Template
Define a template for a generator set and applying it.

17:00 End of the first day

DAY 2

9:00 DSL Syntax and Transfer Function Macro
DSL syntax and coding. DSL standard and special functions. Write transfer function using DSL code.

10:00 Exercise: Implement a Transfer Function Macro
Create a macro and familiarise with DSL coding.

10:30 Coffee break

11:00 Exercise: Complete a Plant Control Model
Use graphical interface and DSL coding. Implement a complete controller for a synchronous generator.

12:30 Lunch break

13:30 Continuation Exercise: Complete Plant Control Model
Find the initial conditions for the different models and test.

15:00 Coffee break

15:30 Dynamic Modelling Auxiliary Elements and DSL Features
Usage of station measurement elements. DSL event function. Special frame features.

16:00 Exercise: Simple Untervoltage Relay
Implement an undervoltage load-shedding relay using DSL and test it. Usage of the special event function.

Optional exercises:
Modelling, initialisation and test of the following models:
- Dynamic Load Model
- Switched Shunts
- Simple PV Plant Model
- Fixed Speed Induction Generator (FSIG) Model

17:00 End of the training course

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