

## INFORMATION

Please complete and sign registration and return either via fax +49 7072 916 888 or a scanned copy via electronic mail to: c.koenig@digsilent.de.

Upon submission of your registration you will receive an acknowledgement of receipt and invoice. Final confirmation will be established after receipt of payment. Without this confirmation your registration is not valid. By our written confirmation your registration becomes legally binding.

### CANCELLATIONS

Up to 8 weeks before the seminar: at no cost  
Up to 2 weeks before the seminar: 50% of the seminar fee  
After the 2 weeks' period: 100% of the seminar fee

DIGSILENT reserves the right to cancel a seminar due to insufficient participants up to 4 weeks before the beginning of the seminar. In the event that an already confirmed seminar needs to be cancelled due to force majeure, participants will be informed as soon as possible and already paid seminar fees will be reimbursed. Further claims like travel expenses or hotel cancellation fees are excluded from this practice if the cancellation of the seminar is not due to a grossly negligent behaviour of DIGSILENT GmbH.

Detailed information about how to get to DIGSILENT will be sent along with the confirmation.

### LUNCHES

Lunches are included in the seminar fees. If you have any special requirements (e.g. vegetarian), please let us know with your registration.

### TRAINING MATERIAL

Our training material is protected by copyright. Duplication or transfer is prohibited and requires the written consent of DIGSILENT GmbH.

### ACCOMMODATION

We recommend booking your accommodation in one of the hotels listed below:

- Hotel Alznauer Hof, Raiffeisenstr. 2, 72810 Gomaringen
- Hotel Arcis, Bahnhofstr. 10, 72810 Gomaringen
- Hotel Nehrener Hof, Bahnhofstr. 57, 72147 Nehren
- Hotel Domizil, Wöhrdstr. 5-9, 72072 Tübingen

### SEMINAR FEES:

For DIGSILENT Users with valid guarantee or maintenance period reduced seminar fees apply. Included in the seminar fees are training material, coffee breaks and lunches.

## REGISTRATION

Company: \_\_\_\_\_

Department: \_\_\_\_\_

VAT No.: \_\_\_\_\_  
(European Community)

First name: \_\_\_\_\_

Last name: \_\_\_\_\_

Street: \_\_\_\_\_

Zip Code: \_\_\_\_\_

City: \_\_\_\_\_

Country: \_\_\_\_\_

E-Mail address: \_\_\_\_\_

Participant's name: \_\_\_\_\_

Invoicing address: \_\_\_\_\_  
(if different)

Signature: \_\_\_\_\_

For how long have you been using PowerFactory regularly?

New user      > 1 year      > 2 years      > 5 years

By submitting the form you agree to the storage and use of your data to process your inquiry at DIGSILENT GmbH.

### PRICE PER PARTICIPANT

Euro **968.00 plus VAT** (with valid licence or maintenance agreement)  
Euro **1,100.00 plus VAT** (without valid licence or maintenance agreement)  
Euro **330.00 plus VAT** (with valid student ID)

## DIGSILENT SEMINAR



# Scripting in PowerFactory with Python

S2017.1017.GO.PYTHON



**17 - 18 October 2017**

Training facilities at DIGSILENT GmbH in Gomaringen

## INTRODUCTION

Python is a programming language, which can be used to control PowerFactory. It is commonly used to automate the execution of time-consuming simulations - however, its application extends far beyond that. Python may also be used to process results, or to implement a routine that applies sequential changes to a network and calls PowerFactory's analysis functions in each step. This seminar provides a compact and efficient introduction to the fundamental aspects of writing scripts inside of PowerFactory by using Python. The course includes basic concepts, syntax, accessing and modification of objects from within the code, automation of a series of calculations and presentation of the results etc. Within the context of the training course numerous scripts will be created, which are supposed to encourage own ideas or which can be adapted to suit particular requirements.

### WHO SHOULD ATTEND

The course is intended for utility engineers, power system operators, project developers, manufacturers, consultants and electrical engineers in general, interested in the scripting in PowerFactory. Participants should be familiar with the basic handling of DigSILENT PowerFactory. Experiences with PowerFactory's DPL, Python itself, as well as C++, C, Java or other scripting languages is not needed but it is an advantage.

## PROGRAMME

### DAY 1

- 09:00h Fundamentals**  
Familiarisation with the general handling of the Python Programming Language in PowerFactory, e.g.: Creation of a Python script in PowerFactory and access to data by using Python. Presentation of the PowerFactory module and comparison between DPL and Python.
- 10:00h PowerFactory Object access with Python**  
Access to calculation relevant objects of different classes inside of the PowerFactory database. Reading objects and their attributes and making necessary changes of these objects.
- 10:30h Coffee break**

- 11:00h Exercise: Object access with Python**  
Accessing all lines available in the network. Reading their lengths and calculating the complete length. Distinguishing whether a line is an overhead line or a cable. Presentation of loops and statements, lists and indexing in Python.
- 12:00h Execution of PowerFactory Commands with Python**  
Access and execution of any type of calculation objects available in PowerFactory.
- 12:30h Lunch break**
- 13:30h Exercise: Execution of Calculation Commands**  
Automatic execution of load Flow calculations. Reading and reporting of calculation results in the output window.
- 14:30h Navigation through the PowerFactory Project**  
Navigation through the project contents and the data base.
- 15:00h Coffee break**
- 15:30h Exercise: Navigation through the Project**  
Automatic execution of load flow calculations for multiple Study Cases and Operation Scenarios. Comparison of results and their output into the output window. Working with "dictionaries" in Python.
- 17:00h End of the first day**

### DAY 2

- 09:00h Report Results, Subroutines and Module**  
Output of customised results in the output window. Introduction of subroutines and modules. Presentation of the built-in modules SYS and IMP.
- 09:30h Exercise: Report Results**  
Access to project and load flow calculation. Reporting, whether a load flow calculation has been executed successfully.
- 10:30h Coffee break**
- 11:00h Exercise: Subroutines and Module**  
Creating subroutines and importing them in the main script. Creating readable reports and preparing them for the export. Introduction of the lambda function and some advanced Python topics.

- 12:30h Lunch break**
- 13:30h Result Files**  
Becoming acquainted with the Result File element (ElmRes) of PowerFactory. Writing/reading data to/from it.
- 13:45h Exercise: Result Files**  
Executing multiple short circuit calculations and saving the results in a result file. Reading and reporting the previously written results.
- 14:45h Graphical Representation**  
Familiarisation with graphical representations in PowerFactory. Automatic creation of plots.
- 15:00h Coffee break**
- 15:30h Exercise: Graphical Representation**  
Using results saved inside the result file. Automatic creation of plots representing how short circuit current changes depending on the short circuit position along a line.
- 16:00h Exporting/Importing data to/from external files**  
Export of calculation results to an external csv-file via script. Automated import of network data from an external csv-file into PowerFactory.
- 16:30h Advanced Python Topics and Discussion**  
Creation of a Graphical User Interface and export/import data to/from Excel or Word.
- 17:00h End of the second day**



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