

Help Links

This document summarizes all the OpenDSS available resources, divided by sections. Keep in mind that some of these resources are constantly being updated.

1. General:

Name	Description	Links
Introduction to OpenDSS	Presents some of the software capabilities, how it has been used, brief history and main objectives	
Getting Started	General instructions about the program's main files, how to register the COM server, how to access the source code and easily update it	
Primer	Extremely useful to new users. Presents a general explanation of how the elements are organized in the software, the GUI and the COM interface, with some full examples. Available in different languages	
Manual	OpenDSS most extensive documentation	
Cheatsheet	List of commonly used OpenDSS Commands	
Forum	Online Discussion, opened to the user community	
Best of Forum	Selection of the best discussions in the Forum. Split in two documents.	

2. COM Interface and DirectDLL:

Name	Description	Links
COM Doc	OpenDSS Type Library Documentation. It presents all the methods and properties available through the COM Interface, including their types and a short description	
COM Speed Comparison	Explanations about simulation speed achieved when using COM interface. How to speed it up by using Early Bindings and Direct Connection Shared Library	
Direct DLL	Extensive documentation about the Direct Connection Shared Library for OpenDSS	
Bus Interface	Presents the properties and methods available through the Bus Interface, including its type, a brief description and example written in VBA	

Circuit Interface	Presents the properties and methods available through the Circuit Interface, including their type and a brief description	
CtrlQueue Interface	Presents an explanation about how OpenDSS manages control elements and how the user can interact with its control process by using the CtrlQueue Interface. Mandatory reading for user who want to implement their custom control elements. Matlab and VBA code examples included	
Solution Interface	Presents the properties and methods available through the Solution Interface, including their type, description and some examples	
Property Visualization	Instructions about how to visualize the OpenDSS list of properties and methods available through COM interface in the programming environment of Matlab, VBA and Python	

3. Modelling:

Name	Description	Links
Modelling Transformer Core Effects in OpenDSS	Explanation about when Core effects in transformer should be relevant, comments regarding the use of symmetrical components, phantom windings and other modelling hints. Includes examples	
3-Phase Transformer Core Modelling	Supplement to “Modelling Transformer Core Effects in OpenDSS”. Discuss how to model transformers with different core designs. Includes an example of a 5-Legged Core Model	
Harmonics Load Modelling	Presents the load modelling in harmonics analysis. Includes a comparison between different load model assumptions	
Multi-Winding Transformers	Discussion about traditional ways of modelling multi-winding transformers and reasons why OpenDSS doesn't use them, followed by the explanation about how the transformer models are developed in OpenDSS	
Regulators as Autotransformers	Complete description about how to model single-phase regulators as autotransformers. Examples included	
Single-Phase Transformers	How to model single-phase, center-tapped distribution transformers. Example included	
Open WYE – Open Delta Connection	Comments about its usage, drawbacks and how it is accomplished in the software	
PV System Element	Complete description of the PV System model in the software. Example included	

Storage Element and Storage Controller	Complete description of the Storage model and the StorageController. Examples included	
UPFC Element	UPFC model description, derivation and simulation results	
XY Curve Object	Different ways of defining the general object XY Curve	
XfrmCode_ LineSpacing	How to use the XfmrCode and LineSpacing to define similar transformers and lines, respectively. Examples included	
Cable Modelling	Explains how Tape Shielded Cables, Concentric Neutral Cables and Line Elements can be modeled in OpenDSS. Includes examples and some questions posted in the Forum about this topic	
Neutral Rules	Explains how the use of the properties Rneut and Xneut in Loads and Transformer elements	
Loadshapes Usage	Explains different ways of importing loadshape data to OpenDSS. Especially useful when dealing with large amounts of data.	

4. Algorithms:

Name	Description	Links
State Estimation	Overview of the State Estimation problem, how it is affected by the system design and load models and how OpenDSS can be used for state estimation. It also contains the description of the Load Allocation default method in OpenDSS	
Load Allocation Algorithm	Complete explanation of the load allocation and state estimation algorithms implemented in the program. Examples included	
Dynamics Mode	Explain how the dynamics mode solution works. Examples included	
FaultStudy Mode	Explain how the short-circuit analysis is performed in the program, including the difference between fault simulations and Fault Study Mode. It also includes a description of the Monte Carlos Fault Study and the COM interface commands related to short circuit analysis. Examples included	

5. Controls:

Name	Description	Links
Smart Inverter Modelling	EPRI's report that describes the implementation of smart inverter, grid-support functions in OpenDSS like Volt-Var, Volt-Watt, Dynamic Reactive Current and more	
Recloser, Relay and Fuse	List of parameters available for the control elements Recloser, Relay and Fuse and their respective description	
SwitchControl Modification	Description of recently implemented parameters for the SwitchControl element	

6. Custom Scripting:

Name	Description	Links
Cap Control DLL	Description of the CapController element in OpenDSS and how to customize it by using a custom control algorithm programmed through a user-written DLL	
Generator User DLL	How to implement a user-written DLL for the Generator model. It includes some comments with respect to Public Data Structure and a list of definitions of all public data variables available.	
Storage Dynamics DLL	How to implement a user-written DLL for the Storage element in the Dynamics mode. It includes some comments with respect to Public Data Structure and a list of definitions of all public data variables available. An example of implementation is given.	
Callback Routines	Contains a listing of the DSSCallbackStructDef.Pas file, which is a structure of Function/Procedure pointers used to support the various user-written DLLs	
Custom Scripting	Describes ways of performing custom scripting and how to do simple scripting of discrete-event sequential-time simulation by using the standalone version of the program.	
Power Conversion Elements Essentials	Contains essential information about PC elements, including its main procedures in Delphi.	
Time-Based Simulations in Matlab	This document is provided to give the reader a basic understating for how to drive the OpenDSS using Matlab for custom calculations and control. Code examples included	

Python-to-OpenDSS Control Interface	Presents the detailed OpenDSS simulation process and how the user can interact with it in order to perform custom control algorithms. Examples included in Python	
Python End-Of-TimeStep Cleanup For Control	New methods included in the COM interface Solution class. Gives the user more flexibility when implementing custom algorithms	
Using the Timers in OpenDSS	Describes the timer functionality added in order to record the simulation time required for different segments of the simulation process. Examples included	