

# PSS®E-PSCAD Network Data Conversion Module

Translate PSS®E Dynamic Networks into  
equivalent PSCAD network models

## At a glance

The PSS®E-PSCAD Network Data Conversion Module directly translates PSS®E dynamic network models into PSCAD network models. The module:

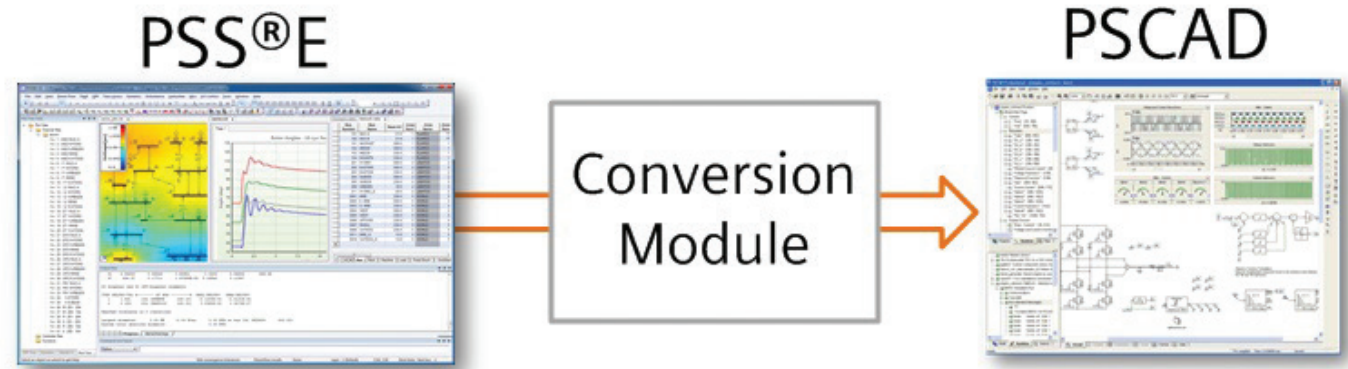
- Builds complete PSCAD equivalent networks from PSS®E networks, including dynamics models.
- Supports the full library of all standard PSS®E machine and control models (generators, exciters, governors, stabilizers, etc.)
- Automatically initializes the PSCAD system (including HVDC links, generators and wind farms)

## The challenge

Users of electromagnetic transients (EMT) simulation programs, such as PSCAD/EMTDC, often face difficulties in obtaining data and developing cases suitable for their studies. Many utilities already have the data available for their entire system in power flow programs, but a great deal of effort is required to manually convert the network data for use in EMT programs.

There are three common challenges:

- Difficulties in manual translation of network data (differences in per-unit systems, data entry, etc.)
- The complexity of creating network equivalents
- Difficulties involved in the initialization of machines, generators or sources in large inter-connected networks



The PSS®E-PSCAD Network Data Conversion Module will directly create PSCAD models, complete with correct data for all busses, loads, DC links, switched shunt devices, branches, generators, transformers, phase shifters, etc. All of these are correctly drawn and graphically interconnected in PSCAD. The Module can translate an entire network, a zone, an area, or a subsystems defined by a number of tiers away from a selected bus. PSCAD diagrams are grouped by location and voltage level, and can be created for a complete network, or just a portion of the network.

#### Network equivalent creation

The PSS®E-PSCAD Network Data Conversion Module generates a complex admittance matrix for the entire system, which can be large (greater than 50,000 busses). It then decomposes this using LDU sparse decomposition techniques to generate the network equivalent. This equivalent is a multi-port representation that will be correct for steady-state, open-circuit and short-circuit analyses. It contains Thevenin equivalent voltage sources to match the power flow and generation in the equivalent network. The equivalents are generated based on the positive and (if available) zero sequence PSS®E networks.

#### System initialization

The bus voltages magnitudes, angles and power flow information (from the solved PSS®E network) are used to directly initialize sources and generators in PSCAD, and to initialize non-linear loads. The initialization information can be used in simple voltage source

representations of generators, or can be used to initialize detailed models of machines, governors, exciters, multi-mass systems, etc. The resulting simulation in PSCAD will exactly match the solved load flow results for any circuit and complex systems with any number of machines. The PSCAD simulation can be initialized without startup oscillations.

#### Data validation

The PSS®E-PSCAD Network Data Conversion Module generates detailed warnings and error messages when it reads in PSS®E network model. This will inform the user of areas of mismatched voltages, inconsistencies in the entry of data, and other data issues.

#### Prerequisites and compatibility

The PSS®E-PSCAD Network Data Conversion Module works with PSS®E version 33, 32, 31, 30, and some older versions. PSS®E version 34 support is coming soon.

The module is based on proven technology from our partner Electranix and their E-TRAN product.

The PSS®E-PSCAD Network Data Conversion Module creates models in the PSCAD version 4 format. In order to make use of the generated PSCAD models, PSCAD version 4 is required. PSCAD is separately licensed, and is available from Manitoba HVDC Research Center.

#### How to get started

For further information or to purchase the PSS®E-PSCAD Network Data Conversion Module, please contact Siemens PTI software sales at [pti-software-sales.ptd@siemens.com](mailto:pti-software-sales.ptd@siemens.com) or +1 518 395 5000.

#### Siemens Industry, Inc.

Siemens Power Technologies International  
400 State Street  
P.O. Box 1058  
Schenectady, NY 12301-1058 USA

©2016 Siemens Industry, Inc.

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.