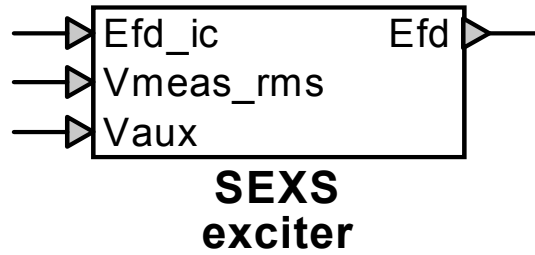


Machine control : exciter SEXS



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1 Description

This device is an implementation of a simplified exciter similar to PSS/E's SEXS simple exciter model. This version of the exciter interprets all input and output values in physical units. For a version with input and output in per-unit quantities, use the device "exciter SEXS pu".

1.1 Pins

This device has four pins:

<i>pin</i>	<i>type</i>	<i>description</i>	<i>units</i>
Efd_ic	input pin	initial field voltage at t=0	V
Vmeas_rms	input pin	measured rms voltage	V
Vaux	input pin	auxiliary voltage order	V
Efd	output pin	field voltage	V

1.2 Parameters

The following parameters must be defined:

<i>parameter</i>	<i>description</i>	<i>units</i>
Ta	time constant (lead) of transient filter	s
Tb	time constant (lag) of transient filter	s
Te	time constant (lag) of exciter	s
K	exciter gain (incl base conversion)	(includes base conversion)
Emin	field voltage low limit	pu(Efd_base)
Emax	field voltage high limit	pu(Efd_base)
V_base	terminal voltage base	V

Efd_base	field voltage base	V
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1.3 Input

The input pins may be connected to any control signals.

The following inputs are available:

input	description	units
Efd_ic	initial field voltage at t=0	V
Vmeas_rms	measured rms voltage	V
Vaux	auxiliary voltage order	V

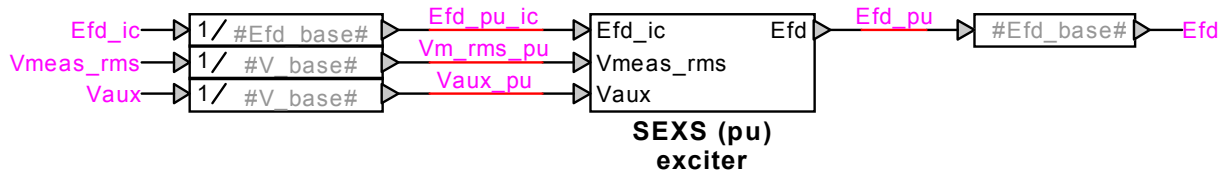
1.4 Output

The output value is the calculated field voltage, in physical units.

output	description	units
Efd	field voltage	V

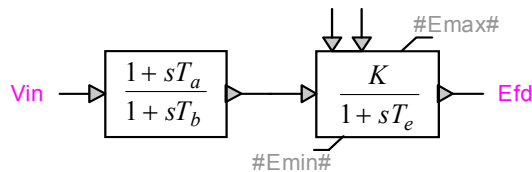
1.5 Representation

The implementation of the model can be inspected by opening the device's subcircuit. The model uses a unit-conversion shell surrounding the per-unit version of this exciter.



The model is self-initializing at t=0.

The dynamic representation of the model is the following:



where

$$V_{in} = V_{ref} - V_{meas_rms} + V_{aux} \quad (1)$$

with the value of V_{ref} calculated to produce $E_{fd} = E_{fd_ic}$ at t=0 .