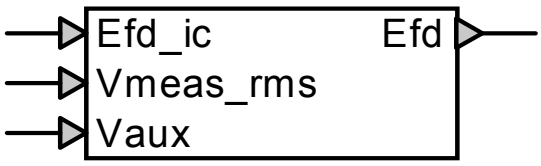
Machine control : exciter SEXS pu



SEXS (pu)
exciter

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 as per-unit quantities. For a version with input and output in physical units, use the device "exciter SEXS".

1.1 Pins

This device has four pins:

pin	*type*	*description*	*units*
Efd_ic	input pin	initial field voltage at t=0	pu(Efd_base)
Vmeas_rms	input pin	measured rms voltage	pu(V_base)
Vaux	input pin	auxiliary voltage order	pu(V_base)
Efd	output pin	field voltage	pu(Efd_base)

1.2 Parameters

The value of the following parameters must be defined:

parameter	*description*	*units*	
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		(includes base conversion)
Emin	field voltage low limit	pu(Efd_base)	
Emax	field voltage high limit	pu(Efd_base)	

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	pu(Efd_base)
Vmeas_rms	measured rms voltage	pu(V_base)
Vaux	auxiliary voltage order	pu(V_base)

1.4 Output

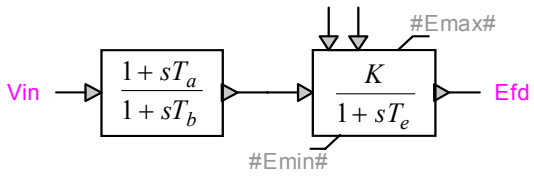
The output value is the calculated field voltage in per-unit of the base field voltage.

output	*description*	*units*
Efd	field voltage	pu(Efd_base)

1.5 Representation

The implementation of the model can be inspected by opening the device's subcircuit.
The model is self-initializing at t=0.

The dynamic representation of the model is the following:



where

$$V_{in} = V_{ref} - V_{meas\_rms} + V_{aux} \qquad (1)$$

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