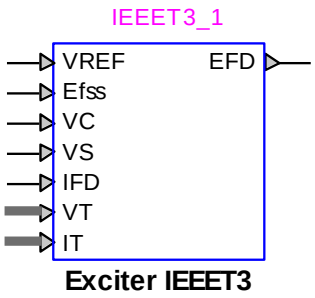
Exciters and Governors: Exciter IEEET3



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1 Description

This device is an implementation of the IEEE Type 3 Excitation System. This device is implemented as described in [1]. Implementation details can be viewed by inspecting the subcircuit of this device.

1.1 Pins

This device has 8 pins:

Pin name	Type	Description	Units
VREF	Input	Reference voltage of the stator terminal voltage	pu
Efss	Input	Steady-state field voltage at t = 0, for initialization	pu
VC	Input	Terminal voltage of synchronous machine, transducer output	pu
VS	Input	Power System Stabilizer signal	pu
IFD	Input	Field current signal	pu
VT	Input, bundle	Terminal voltage (phasor) of synchronous machine (magnitude and phase)	pu
IT	Input, bundle	Current (phasor) of synchronous machine (magnitude and phase)	pu
EFD	Output	Field voltage signal	pu

1.2 Parameters

The default set of parameters can be found in [1].

1.2.1 Data tab

The parameters on the Data tab are:

1. **Gain K_A**: voltage regulator gain
2. **Time constant T_A**: voltage regulator time constant
3. **Voltage V_{Rmax}**: Maximum voltage regulator output
4. **Voltage V_{Rmin}**: minimum voltage regulator output
5. **Gain K_F**: rate feedback gain
6. **Time constant T_F**: rate feedback time constant

1.2.2 Exciter tab

The parameters on the Exciter tab are:

1. **Gain K_P**: potential circuit gain coefficient
2. **Gain K_I**: potential circuit (current) gain coefficient
3. **Gain K_E**: exciter field proportional constant
4. **Time constant T_E**: exciter field time constant
5. **Voltage V_{Bmax}**: maximum available exciter voltage

2 Initial conditions

The reference voltage VREF can be manually or automatically set by connecting or not connecting the input signal VREF, respectively. When VREF is not connected (the signal is zero), the reference voltage is internally found from the steady-state solution. When VREF is connected, its initial value must match the per unit steady-state voltage of the stator terminal voltage, since otherwise the generator voltage will not start at the actual steady-state.

3 References

[1] PSS®E MODEL LIBRARY PSS®E 32.0.5, Siemens Energy, Inc.