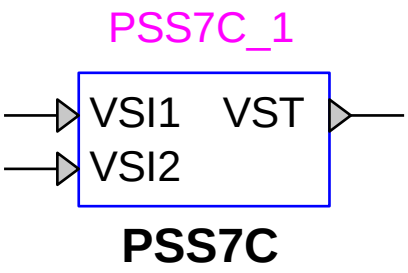
Exciters and Governors: Power System Stabilizer PSS7C



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1 Description

This device is an implementation of the IEEE type PSS7C (M = 5 and N = 1) power system stabilizer model. 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 3 pins:

Pin name	Type	Description	Units
VSI1	Input	Speed	pu
VSI2	Input	Electrical power	pu
VST	Output	PSS output	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_{S1}**: PSS main gain
2. **Gain K_{S2}**: PSS gain
3. **Gain K_{S3}**: PSS gain
4. **Time constant T_6**: PSS transducer time constant
5. **Time constant T_7**: PSS transducer time constant
6. **Time constant T_{w1}**: PSS washout time constant

7. **Time constant T_{w2}**: PSS washout time constant
8. **Time constant T_{w3}**: PSS washout time constant
9. **Time constant T_{w4}**: PSS washout time constant
10. **Time constant T_8**: PSS transducer time constant
11. **Time constant T_9**: PSS washout time constant
12. **Gain K_0**: PSS canonical gain 0
13. **Gain K_1**: PSS canonical gain 1
14. **Gain K_2**: PSS canonical gain 2
15. **Gain K_3**: PSS canonical gain 3
16. **Gain K_4**: PSS canonical gain 4
17. **Gain K_{I3}**: PSS third block gain
18. **Gain K_{I4}**: PSS fourth block gain
19. **Time constant T_{I1}**: PSS time constant (first block)
20. **Time constant T_{I2}**: PSS time constant (second block)
21. **Time constant T_{I3}**: PSS time constant (third block)
22. **Time constant T_{I4}**: PSS time constant (fourth block)
23. **Maximum limit V_{SI1max}**: input signal #1 maximum limit
24. **Minimum limit V_{SI1min}**: input signal #1 minimum limit
25. **Maximum limit V_{SI2max}**: input signal #2 maximum limit
26. **Minimum limit V_{SI2min}**: input signal #2 minimum limit
27. **Maximum PSS output V_{STMAX}**: maximum PSS output
28. **Minimum PSS output V_{STMIN}**: minimum PSS output
29. **PSS activation P_{PSSON}**: generator MW threshold for PSS activation
30. **PSS de-activation P_{PSSOFF}**: generator MW threshold for PSS de-activation

2 Initial conditions

The initial output signal is zero from the steady-state solution.

3 References

[1] "IEEE Recommended Practice for Excitation System Models for Power System Models for Power System Stability Studies," IEEE Standard 421.5-2016.