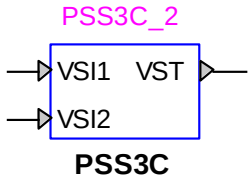
Exciters and Governors: Power System Stabilizer PSS3C



Exciters and Governors: Power System Stabilizer PSS3C 1
1 Description 1
1.1 Pins 1
1.2 Parameters 1
1.2.1 Data tab 1
2 Initial conditions 2
3 References 2

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1 Description

This device is an implementation of the IEEE type PSS3C 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	Electrical power	pu
VSI2	Input	Speed deviation	pu
VST	Output	PSS output (equivalent of terminal voltage)	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}**: Power system stabilizer gain for input channel 1
2. **Gain K_{S2}**: Power system stabilizer gain for input channel 2
3. **Time constant T_1**: PSS transducer time constant for input channel 1
4. **Time constant T_2**: PSS transducer time constant for input channel 2
5. **Time constant T_{W1}**: Washout time constant (input channel 1)
6. **Time constant T_{W2}**: Washout time constant (input channel 2)
7. **Time constant T_{W3}**: Washout time constant (combined channels)
8. **Filter constant A_1**: PSS denominator coefficient (first block)

9. **Filter constant A_2**: PSS denominator coefficient (first block)
10. **Filter constant A_3**: PSS denominator coefficient (first block)
11. **Filter constant A_4**: PSS denominator coefficient (first block)
12. **Filter constant A_5**: PSS numerator coefficient (second block)
13. **Filter constant A_6**: PSS numerator coefficient (second block)
14. **Filter constant A_7**: PSS denominator coefficient (second block)
15. **Filter constant A_8**: PSS denominator coefficient (second block)
16. **Maximum output V_{STMAX}**: PSS maximum output signal
17. **Minimum output V_{STMIN}**: PSS minimum output signal
18. **PSS activation P_{PSSON}:** Generator MW threshold for PSS activation
19. **PSS 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.