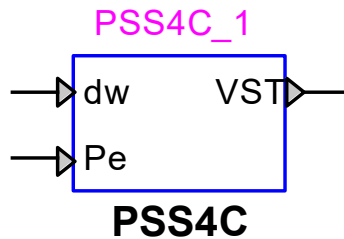


Exciters and Governors: Power System Stabilizer PSS4C



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1 Description

This device is an implementation of the IEEE type PSS4C 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 |
|----------|--------|------------------|-------|
| dw | Input | Speed deviation | pu |
| Pe | 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_{VL}** : very low band gain
2. **Gain K_{VL1}** : very low band differential filter gain
3. **Coefficient K_{VL11}** : very low band first lead-lag block coefficient
4. **Time constant T_{VL1}** : very low band numerator time constant
5. **Time constant T_{VL2}** : very low band numerator time constant
6. **Time constant T_{VL3}** : very low band numerator time constant
7. **Time constant T_{VL4}** : very low band numerator time constant

8. **Time constant T_{VL5}** : very low band numerator time constant
9. **Time constant T_{VL6}** : very low band numerator time constant
10. **Gain K_{VL2}** : very low band differential filter gain
11. **Coefficient K_{VL17}** : very low band first lead-lag block coefficient
12. **Time constant T_{VL7}** : very low band numerator time constant
13. **Time constant T_{VL8}** : very low band numerator time constant
14. **Time constant T_{VL9}** : vert low band numerator time constant
15. **Time constant T_{VL10}** : very low band numerator time constant
16. **Time constant T_{VL11}** : very low band numerator time constant
17. **Time constant T_{VL12}** : very low band numerator time constant
18. **Very low band upper limit V_{VLmax}** : very low band upper limit
19. **Very Low band lower limit V_{VLmin}** : very low band lower limit
20. **Gain K_L** : low band gain
21. **Gain K_{L1}** : low band differential filter gain
22. **Coefficient K_{L11}** : low band first lead-lag block coefficient
23. **Time constant T_{L1}** : low band numerator time constant
24. **Time constant T_{L2}** : low band numerator time constant
25. **Time constant T_{L3}** : low band numerator time constant
26. **Time constant T_{L4}** : low band numerator time constant
27. **Time constant T_{L5}** : low band numerator time constant
28. **Time constant T_{L6}** : low band numerator time constant
29. **Gain K_{L2}** : low band differential filter gain
30. **Coefficient K_{L17}** : low band first lead-lag block coefficient
31. **Time constant T_{L7}** : low band numerator time constant
32. **Time constant T_{L8}** : low band numerator time constant
33. **Time constant T_{L9}** : low band numerator time constant
34. **Time constant T_{L10}** : low band numerator time constant
35. **Time constant T_{L11}** : low band numerator time constant
36. **Time constant T_{L12}** : low band numerator time constant
37. **Low band upper limit V_{Lmax}** : low band upper limit
38. **Low band lower limit V_{Lmin}** : low band lower limit
39. **Gain K_I** : intermediate band gain
40. **Gain K_{I1}** : intermediate band differential filter gain
41. **Coefficient K_{I11}** : intermediate band first lead-lag block coefficient
42. **Time constant T_{I1}** : intermediate band numerator time constant
43. **Time constant T_{I2}** : intermediate band numerator time constant
44. **Time constant T_{I3}** : intermediate band numerator time constant
45. **Time constant T_{I4}** : intermediate band numerator time constant
46. **Time constant T_{I5}** : intermediate band numerator time constant
47. **Time constant T_{I6}** : intermediate band numerator time constant
48. **Gain K_{I2}** : intermediate band differential filter gain
49. **Coefficient K_{I17}** : intermediate band first lead-lag block coefficient
50. **Time constant T_{I7}** : intermediate band numerator time constant
51. **Time constant T_{I8}** : intermediate band numerator time constant
52. **Time constant T_{I9}** : intermediate band numerator time constant
53. **Time constant T_{I10}** : intermediate band numerator time constant
54. **Time constant T_{I11}** : intermediate band numerator time constant
55. **Time constant T_{I12}** : intermediate band numerator time constant
56. **Low band upper limit V_{Imax}** : intermediate band upper limit
57. **Low band lower limit V_{Imin}** : intermediate band lower limit
58. **Gain K_H** : high band gain
59. **Gain K_{H1}** : high band differential filter gain
60. **Coefficient K_{H11}** : high band first lead-lag block coefficient
61. **Time constant T_{H1}** : high band numerator time constant
62. **Time constant T_{H2}** : high band numerator time constant
63. **Time constant T_{H3}** : high band numerator time constant

64. **Time constant T_{H4}** : high band numerator time constant
65. **Time constant T_{H5}** : high band numerator time constant
66. **Time constant T_{H6}** : high band numerator time constant
67. **Gain K_{H2}** : high band differential filter gain
68. **Coefficient K_{H17}** : high band first lead-lag block coefficient
69. **Time constant T_{H7}** : high band numerator time constant
70. **Time constant T_{H8}** : high band numerator time constant
71. **Time constant T_{H9}** : high band numerator time constant
72. **Time constant T_{H10}** : high band numerator time constant
73. **Time constant T_{H11}** : high band numerator time constant
74. **Time constant T_{H12}** : high band numerator time constant
75. **Low band upper limit V_{Hmax}** : high band upper limit
76. **Low band lower limit V_{Hmin}** : high band lower limit
77. **Maximum PSS output V_{STMAX}** : maximum PSS output
78. **Minimum PSS output V_{STMIN}** : minimum PSS output
79. **Inertia constant H** : Inertia constant
80. **Filter frequency W_{n1}** : first notch filter frequency
81. **Filter bandwidth B_{W1}** : first notch filter 3 dB bandwidth
82. **Filter frequency W_{n2}** : second notch filter frequency
83. **Filter bandwidth B_{W2}** : second notch filter 3 dB bandwidth

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.